Volume 93 Number 18

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

THIRD quarter financial reports from leading steel companies reflect (p. 11) the improvement in production registered during the late summer months. Deficits are fading, all being lower than in the second quarter or in the third quarter last year. Republic, third largest producer, emerged into the profit area for the first time since the second quarter of 1930 . . . . Outlook for the rest of the year is not so bright, the fall in new business offsetting (p. 43) a higher price structure. The past week operations (p. 14) fell 4 points to 30 per cent, the lowest level since the last of April. Further recession is in prospect, steelmakers being unable to discern any brakes to check the decline.

Courage To "Carry On" Is Unfaltering

However, there is no desire to sell short on faith, Myron C. Taylor, Steel corporation chief, declaring (p. 10) that industry's "faith in the future is undimmed" and that it is the duty of industry to accord the President "utmost of counsel and co-operation." . . . These should be comforting words to President Roosevelt, who finds himself (p. 15) in the tight spot of having to hold on to a traditional patrician policy, at the same time acceding in some measure to plans designed to quiet simmerings of unrest which have bubbled up in certain sections of the country . . . . Labor unrest is proving troublesome (p. 19) to automobile manufactures who are becoming pressed for time in the introduction of new models.

European Industry Celebrates Revival

From abroad come optimistic reports (p. 17) on condition of the steel industry, with production in England, France and Germany showing over 20 per cent improvement, comparing the first eight months of 1933 with the same period in 1932 . . . . Foreign trade balance in iron and steel products of the United States for September became less favorable (p. 18), exports declining and imports gaining. Decline in exports was caused chiefly by a reduction in tonnage of scrap shipped to foreign shores . . . . With foreign trade falling and domestic business at low ebb, increasing importance becomes attached to the government rail program. Efforts continue to be made to have mills reduce the price to $35 per ton. Critics of the "fixed" price system fail to realize that it has saved railroads millions (p. 22) over what they would have paid under a fluctuating system such as used in England.

Furnaces Perfected for Bright Annealing

Uniformity, freedom from decarburization and oxidation, and bright finish in the annealing of cold-rolled strip steel have been realized by an eastern producer of this material through the installation (p. 25) of bell-type, controlled atmosphere, electric annealing furnaces . . . . A rotary carburizing furnace handling screw stock was geared to make one revolution in 10 minutes, thereby eliminating (p. 35) breaking and warping on threads encountered when continuous tumbling formerly was performed . . . . Carbon and stainless steels are used in the construction (p. 27) of two new types of beer barrels, one of which is all steel and the other a combination of wood and steel.

New Light Thrown on Steelmaking Methods

Of the 2,900,000 B.t.u. required to melt, refine and pour a ton of steel, 800,000 B.t.u. must be added to the bath for each ton. More heat can be obtained from the gas fired into an open-hearth by lowering the gas velocity, and to maintain the present production rate with a lower gas velocity, the furnace chamber must be enlarged, necessitating (p. 28) a raising of the furnace roof . . . . For every grade of steel there is a proper iron oxide content of the metal, and therefore of the slag, before deoxidation. Two general methods have been developed (p. 30) for arriving at the desired iron oxide content of the slag. . . . Repair of the broken rack of a large sponge ball press in a wrought iron plant was accomplished (p. 31) quickly and economically by thermit welding.

Faith!

BY MYRON C. TAYLOR
Chairman, United States Steel Corp.

I HAVE faith that times will shortly be better. The National Industrial Conference board finds from its comprehensive compilations that the present depression reached its depth about the middle of last year, and that the world as a whole has since then made slow but substantial progress. If one doubts that, as far as this country is concerned at least, let him compare present conditions with those that obtained a year ago and answer whether he would exchange.

We are now in a period of marked transition, but it is well to remember that all human change has been for ultimate progress, even though change oftimes means temporary retrogression. We are passing through a social and economic upheaval unparalleled in modern times. It is interesting to recall, however, that ever since the Pharoahs there have been lean years and fat years, and in ancient times there was alternately abundance and want in the land, largely as there was rain and draught. Which it should be lay in the lap of the gods, and the decision was essentially beyond man's ken and ability to control. We must remember that it is inherent in human nature to stumble and fall, to rise, to walk, to run, only to stumble and fall again. We in modern times still have our cycles of depression and prosperity, but thanks to our control over nature's forces, abundance or want is now largely for man to decide by his own actions and determination.

Our history as a nation is most intriguing. I have often asked myself, how far did necessity, how far did conditions of abject poverty which in many cases surrounded our forefathers and which were more or less general in the old country, how far did restraint of personal and religious liberty, how far did love of adventure lead our progenitors into such hazardous quests for new lands and new homes? Leaving homes, families and friends behind, they breasted the mighty seas in ships we would not dare to use. They entered an unexplored and unknown wilderness infested with savages and wild animals. They exposed themselves to the rigors of our climate, ill-prepared and without what we would term suitable medical aid. They brought frail women, unaccustomed to such hardships, with them. Whatever it was, its urge was irresistible, its success complete. There is still a great vein of adventure in us, and since the continent has been explored and largely conquered we have turned to commerce and industry as a field in which to engage with zest and courage, to satisfy the craving for action.

Opportunities Rest More in Our Own Hands

In the brief time of three centuries we have wrought wonders, not the least of which is respite from arduous physical labors which were performed exclusively by man and by beast in the earlier days of our colonial life and down to a quite recent period. If the time comes when by ordered arrangement we can bring about the production and distribution of consumable materials and supplies—not permanent in their character perhaps—and the adventure and its zest have paled, to what will we turn those talents and energies that it may well be considered worthy of our best traditions and our talent and our strength? It would seem that what we next make of our opportunities rests more than ever before in our own hands.

This brings us to the thought that we are not entirely certain of the ultimate hours and days of labor that will prove desirable for man. We are faced with something which only a short time since we vainly sought and prayed that we might enjoy—and that is greater leisure. But we were perhaps thinking of it in terms only of ourselves, and not of those about us, though if the signs are read correctly it would appear that the tendency through recent years has been toward general reduction of the hours of labor. This tendency is particularly evident in our industry, in which hours generally have been reduced from 12 to eight. These great changes follow not upon an effort or agitation to bring them about, but rather upon necessities like the one in which we now find ourselves. In this present situation hours of labor and the days of labor are lost sight of in the formula to distribute among those who are customarily employed in a particular establishment the work for which there are orders.

To Use Leisure Intelligently Is Problem

But it may be inferred that we face a condition in which generally in the community there will be more leisure. The question before us next will be, how shall that leisure be employed. We are confronted in this nation and in others with a testing period. The moral fiber of the community must either stand the strain of temptation accompanying greater leisure, or use it in such ways as to reinvigorate the individual, to expand his life in many new directions, to cultivate his mind, to learn that there is a realm filled with great privileges and opportunities apart from the work of the world, in which he can become more understanding and more closely in touch with the infinite.

Our own problems in America differ greatly from those of other lands, in that our industrial structure is largely built upon the necessities of home consumption, and within our borders can be produced practically everything that our people require. The means of production are such that an orderly system must ultimately eventuate, involving as it will all conditions of employment. Out of the fermentation caused by this upheaval will come, slowly but surely, plans and policies which in effect will adjust production to consumption and the relation of men and women to production—and from that point onward we will start upon another cycle in which opportunity for leisure will form a part. Through the proper use of that leisure we may further develop a new American type which will find at least the golden key to all the hidden mysteries.

There is no doubt that President Roosevelt has caught the spirit of these impressive changes, and in an hour of peril and need has lent himself to the task of leadership. It is the plain duty of every American to render to him the utmost of counsel and co-operation in these great undertakings. Industry has never lacked courage. It has shown its staying powers through this great depression. Its faith in the future is undimmed. Industry will carry on!

*From an address delivered at the eleventh annual meeting of the American Institute of Steel Construction Inc., Chicago, Oct. 20, 1933.

Steel Deficits Fade in Third Quarter; News of the Week

FIRST returns on the financial showing of the iron and steel industry for the third quarter are distinctly encouraging. Without exception, improvement is reported over both the second quarter of this year and the third quarter of last year.

Republic, in "the red" for two years, has joined National, Wheeling and Ludlum on the honor roll of profit-makers. Bethlehem, Jones & Laughlin, Sheet & Tube and Otis reduced their second quarter losses, in some instances almost to the vanishing point.

For the first time in several years the last Tuesday of the month, when the United States Steel Corp. issues its report, is also the last day of the month, hence the Corporation statement is last instead of first and a detailed comparison of the industry and its showing on a per ton basis are forced over until the Nov. 6 issue of STEEL.

Bethlehem Near Profit

¶Bethlehem Steel Corp., second largest producer, in the third quarter piled up an operating profit that came within $283,097 of offsetting its expenses, interest charges and provision for depletion and depreciation. In the second quarter the net loss was almost 12 times as great, or $3,312,846, while in the third quarter of last year the deficit reached the proportions of $5,425,724. Details of Bethlehem's showing follow:

	Quarter Second 1933	Quarter Third 1933
Total income of the corporation and its subsidiary companies	$4,879,146	$1,669,559
Less — Interest charges	1,688,534	1,662,550
Balance	$3,190,612	$ 7,009
Less—Provision for depletion and depreciation	3,473,709	3,319,855
Net income for the period	*$ 283,097	*$3,312,846

*Deficit.

Eugene G. Grace, president of Bethlehem, forcast that operations, now at 24 per cent, would decline gradually unless substantial railroad buying develops. The increase in unfilled orders from $42,647,681 on June 30 to $72,155,458 on Sept. 30 he attributed chiefly to naval contracts amounting to over $28,000,000, to be spread over two years.

Other observations of Mr. Grace: Bethlehem's costs under the code are being increased $1,000,000 a month instead of the estimated $700,000; public works should prove of increasing importance in tonnage; imports are less menacing due to the exchange situation; there are no tangible developments yet regarding railroad equipment; railroads should require an average of 2,000,000 tons of rails annually for maintenance.

¶Republic Steel Corp., Cleveland, third largest producer, also reports a profit, its first since the second quarter of 1930. Net income of $148,239 in the third quarter compares with a loss of $407,451 in the second quarter, and a deficit of $3,419,353 in the third quarter of 1932. Republic's profit from operations, after charges, was $215,895, this being reduced by $67,656 guaranteed Trumble-Cliffs Furnace Co. preferred dividends.

¶Jones & Laughlin Steel Corp., Pittsburgh, fourth largest producer, showed an operating profit in the third quarter for the the first time in two years. After all expenses, repairs, maintenance and taxes, earnings of $499,149 were reported. But depreciation of $1,400,257, plus bond interest and preferred dividends, turned the quarter into a loss of $1,143,917. In the second quarter the deficit was $1,682,801. The company passed payment on its cumulative preferred stock, on which 25 cents a quarter has been paid.

¶Youngstown Sheet & Tube Co., Youngstown, O., fifth largest producer, reported third quarter loss, after all charges including depreciation and depletion, of $1,177,576, compared with a loss of $2,207,592 in the second quarter and loss of $3,241,444 for the third quarter of 1932. Before depreciation and depletion, Sheet & Tube third quarter profit was $433,828. For nine months, the company's loss is $6,858,540, contrasted with a deficit of $9,588,042 in the first nine months of 1932.

¶Wheeling Steel Corp., Wheeling, W. Va., eighth largest producer, for the second successive quarter turned in a profit. For the third quarter its net, after all charges, was $263,335, compared with a net of $482,143 in the second quarter, and a loss of $775,352 in the third quarter of 1932. The nine-month loss for 1933 is only $56,940, against $2,284,813 a year ago.

¶Otis Steel Co., Cleveland, ninth largest steelmaker, stayed in the red in the third quarter, with a loss of $182,205, after charges, which was less than the $257,253 loss in the preceding quarter. The 9-month showing of Otis this year is a net loss of $1,139,829, after charges compared with $2,176,196 a year ago.

Ludlum Also in Black

¶Ludlum Steel Co., Watervliet, N. Y., registered net profit of $166,305, after all charges, in the third quarter, against profit of $20,429 in the second quarter. Net profit of $79,070 in nine months of 1933 compares with net loss of $241,412 in the corresponding period of 1932.

¶United Engineering & Foundry Co., Pittsburgh, has declared unchanged dividends of 25 cents on the common and $1.75 on its preferred stock, both payable Nov. 10 to Oct. 31 record.

¶M. A. Hanna Co., Cleveland, third quarter net income of $477,424 compares with net of $232,414 in the second quarter. For nine months ended Sept. 30, net income of $872,334 contrasts with $452,935 a year ago.

¶Transue & Williams Steel Forging Corp., Alliance, O., third quarter net profit, after charges was $3740, against net loss of $23,491 in second quarter and $55,564 loss in third quarter of 1932. Net loss for three quarters is $69,541, compared with $82,266 loss last year.

¶Pittsburgh Screw & Bolt Corp.,

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AND THE REAR LOOKS LIKE THE FRONT: This "dream car" designed by the Briggs Mfg. Co., Detroit, and exhibited at the Ford show last week seats three in front by eliminating running boards, has a periscope instead of a rear-view mirror, uses stainless steel arm chairs instead of conventional seats

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Pittsburgh, reports $110,691 profit for the third quarter, the first profit for any quarter of 1933. For nine months of 1933 loss is $183,297, compared with loss of $621,727 in the same period of 1932.

¶Link-Belt Co., Chicago, showing for nine months is a net profit of $52,-130, compared with loss of $319,809 in the corresponding period of 1932.

¶Virginia Iron, Coal & Coke Co., Roanoke, Va., for the third quarter, after deductions, experienced a net loss of $24,969 against $23,000 in the second quarter. For nine months, the deficit is $61,540, against $52,585 a year ago.

¶Wall Street is guessing that National Steel Corp., Pittsburgh, will show a profit of $760,000 in the third quarter, equal to 35 cents a share, compared with a net of $1,532,466 in the second quarter, and $155,075 in the third quarter of 1932.

Codes

FOUR divisions, each headed by a division administrator for the four major classifications of industry, to be responsible for consideration of pending codes and administration of approved codes, have been set up by Hugh S. Johnson, NRA administrator.

Steel, along with other metals, coal, automobiles, shipping and related industries, falls into division I, called the extractive industries. The division administrator is K. M. Simpson, who presided over the steel hearing, and his deputies are W. H. Davis, Philip C. Kemp, K. J. Ammerman and L. H. Peebles.

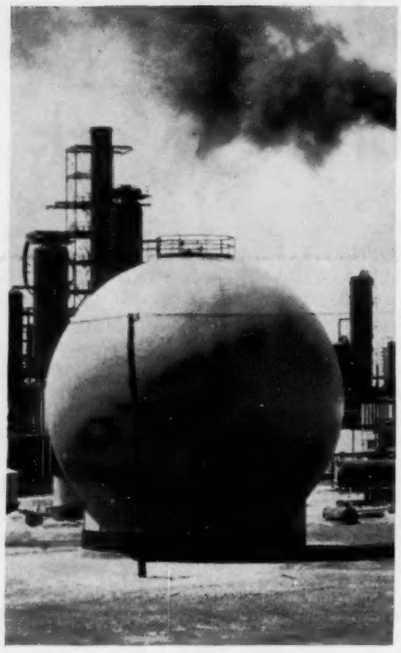
Heading division II, described as "construction and machinery," including lumber and metal products, is Division Administrator Malcolm Muir, with Tom Glasgow, H. O. King and Malcolm Pirnie as deputies. Chemicals, leather and other manufactures fall into division III headed by Gen. C. C. Williams, with R. B. Paddock, W. W. Pickard and R. S. Conkling his deputies.

All trades and services, textiles and clothing are marshaled into division IV under Division Administrator Arthur D. Whiteside, with Dr. E. D. Howard, Dr. Lindsay Rogers and J. B. Dickey his deputies.

Pending appointment of a national compliance director, General Johnson will serve. The administrative branch of the compliance division has been placed in charge of G. C. Royall Jr.

Gen. T. S. Hammond, of the Whiting Corp., Harvey, Ill., heads the trade association division, created to prepare plans for and to advise the organization of industry for industrial self-government.

¶To back up and protect domestic manufacturers who are vulnerable to imports because they have complied with NRA and increased their costs, General Johnson has set up an import division of NRA, of which Oscar B. Ryder, formerly assistant chief of the economics division of the tariff commission, is head. This division is to study import statistics to determine whether any imports which are substantial or increasing in ratio to domestic production shall be recommended to the President for further investigation, and to consider complaints.



LATEST IN TANK CONSTRUCTION: The Hortonsphere, completely arc welded by the shielded arc process, developed by the Lincoln Electric Co., Cleveland. The tank was built for Empire Refining Co., Ponca City, Okla., by the Chicago Bridge & Iron Works, Chicago

¶The President last week approved codes for the plumbago crucible industry, the steel tubular and fire box boiler industry and the industrial supplies and distributors trade.

¶To Deputy Administrator Malcolm Pirnie, presiding over the reinforcing material fabricating industry, William H. Pouch, representing the Concrete Reinforcing Steel institute, declared Oct. 23 that the industry is in competition with steel mills to an extent requiring identical maximum hours and minimum wage rates.

Volume of business of the industry has declined from $50,000,000 annually to between $8,000,000 and $9,-000,000. Representatives of labor objected to the inclusion of erection work in the code and demanded a 30-hour, 5-day week and a minimum weekly wage for common labor of not less than $25, regardless of geographical or sectional lines. Another demand of labor was a flat minimum wage rate of 83 1/3 cents per hour.

Frank B. Jacobson, counsel for the American Concrete Expansion Joint Co., Chicago, reiterated his company's support of NRA but maintained that it does not belong under the reinforcing code.

¶Employment has been increased as much as 80 per cent by some of the larger units since January, with an increase of 155 per cent in payrolls, representatives of the refractories industry stated at their code hearing Oct. 25. Invested capital of the industry exceeds $150,000,000, and some 20,000 workmen are employed when operations are at 60 per cent.

The refractories code proposes minium wage rates from 25 cents an hour in four southern states to 40 cents an hour in the district embracing Pittsburgh and Salina, Pa., and Niles, O.

Objections were registered to including insulated brick under the refractories code. There also was objection to the establishment of uniform prices for No. 1 Ohio and No. 1 Kentucky firebrick.

¶Public hearing of the grinding wheel industry code was held Oct. 26, the code calling for a 40-hour week and a minimum of 36 cents an hour for male and 30 cents for female workers. Labor proposed a 30-hour week and a 50-cent minimum.

¶Provision for watchmen, apprentices, shipping crews and superannuated employes, omitted from the cast iron soil pipe code approved by the President Sept. 7, was considered Oct. 23. The code provides for a 27-hour week, but changes proposed restrict watchmen to 56 hours and shipping crews to 40 hours.

¶An unusual opening of a code hearing was the commendation of Assistant Deputy Administrator B. S. King for the co-operation of the cast iron boiler and cast iron radiator industry. The code provides a 40-hour week, with a minimum of 40 cents per hour, and learners and apprentices at 80 per cent of this minimum. Labor representatives proposed a 30-hour week and objected to the merit clause.

¶Lake Carriers' association, Cleveland, has submitted a code providing for a maximum work-week of 56 hours and a minimum wage of $2.05 a day, to apply to ships in the iron ore, coal, grain and other carrying trades on the Great Lakes.

¶Forthcoming code hearings: Alloy casting industry, Nov. 2; gear manufacturing industry, Nov. 8.

¶Dan M. Avey, editor of *The Foundry*, Cleveland, and H. M. Holt, Bohn Aluminum & Brass Co., Detroit, have been appointed advisors for the non-

ferrous foundry industry code hearing.

¶Nearly 1,000,000 replies to the questionnaire seeking to compare employes and payrolls June 17 and Oct. 14 were received up to Oct. 25. The number of questionnaires distributed was 3,500,000.

Institute

DIRECTORS of the American Iron and Steel institute, meeting Oct. 27 with Donald Richberg and K. M. Simpson, representing NRA, were considering a revision of the method of quoting steel to railroads.

It is understood that quotations will include the cost of transportation from the manufacturing point to the point of delivery, eliminating discrepancies existing at this time.

Other commercial resolutions were considered, probably to be announced shortly.

Changes in the rating of ingot capacities of individual producers may result this week.

The vigor with which the institute is expanding its activities under the steel code appears to leave little question as to the enthusiasm of the industry on renewing the pact after Nov. 19.

¶Inadvertently, the institute last week in promulgating a revision of Commercial Resolution No. 13 included cold-finished carbon steel bars in both paragraphs "g" and "h". These bars should be omitteed from paragraph "g," as printed on page 12 of STEEL for Oct. 23 inasmuch as they are dealt with in paragraph "h."

Washington

GEN. HUGH S. JOHNSON, NRA administrator, jaywalked into a flivver Friday when he declared that the Ford Motor Co., through refusing to sign the automobile industry code, is ineligible for government contracts and quoted Edsel Ford as saying that the company never would put anything looking toward collective bargaining with its employes in effect.

General Johnson also declared that if any auto company fails to submit to the national automobile chamber of commerce, which is administering the code, the statistics required of all members of the industry, whether or not they are signers of the code, he would turn the matter over to the attorney-general.

This aggressiveness by General Johnson drew the following blistering statement from the Ford company in Detroit:

"Mr. Johnson's vocabulary has got him down again. Before assuming the airs of a dictator he should fortify himself with evidence that Henry Ford has refused compliance with government requirements. The public has known the Ford Motor Co. for 30 years and is not dependent on Mr. Johnson for information concerning it.

"It is an act of injustice for Mr. Johnson to intimate that any refusal has been made of any proper demand on the Ford Motor Co., especially since Mr. Johnson knows that even his original signers have not yet had time to file the reports which he charges this company with refusing. We suggest a code of fair publicity for Mr. Johnson's interviews."

The contest between General Johnson and Mr. Ford has come to a head through the civilian conservation corps asking bids on 500 to 2000 trucks, it being claimed in Washington that Fords cannot be purchased because they are not made under the blue eagle.

Labor

REPRESENTATIVES of steel producers whose captive coal mines in Western Pennsylvania still are tied up by strike because of dispute over the checkoff, are expected to confer with the President Monday and reach an agreement.

Washington insists that the bituminous coal code apply to the "captive" mines. To this, owners assent with the exception that the checkoff system, whereby union dues are deducted from miners pay envelopes, be enforced only when miners themselves request it. Demanding no exceptions, miners continue on strike.

In a letter to the President late last week, Myron C. Taylor, chairman of the United States Steel Corp., informed the President that negotiations with the miners had not broken down.

Transportation

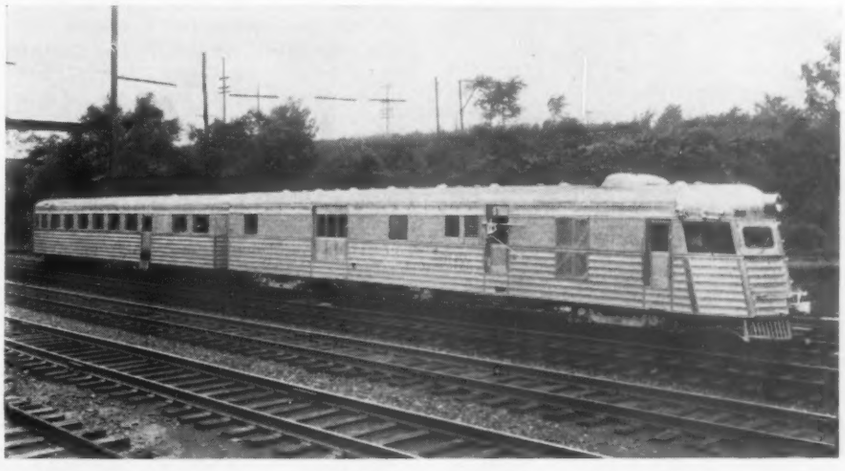
AFTER considering producers' offers of $37.75, mill, for standard rails, Federal Railroad Co-ordinator Eastman Friday stated he had reached a decision and would make a statement Saturday.

Originally, in offering 84,525 tons to the mills, Mr Eastman specified a reduction from $40 a ton, the going market then, to $35 or less, and as an alternative proposed that mills open their books to prove they could not make so great a reduction.

The offer of the mills—unaccompanied by their books—practically splits the difference.

Negotiations for 245,221 tons of fastenings to accompany these rails are in abeyance pending a decision on rails, but are expected to mature shortly. The equipment program also is being blocked by rails.

Since rail contracts usually carry a clause that any adjustment during the calendar year in the general market is retroactive, it is believed that a reduction of $2.25 will have to be



STAINLESS STEEL MAKES THIS TRAIN THE "MOST MODERN": This two-car stainless steel, shotwelded, air-conditioned, rubber tired, gasoline-driven train, built by Budd Mfg. Co., Philadelphia, and about to be put in service by the Texas & Pacific railroad, will provide 50 per cent more speed than the two-car steam train it is replacing, with one-fifth the horsepower, one-sixth the weight, at one-half the operating cost. Making 75 miles per hour and accommodating 76 passengers, this train weighs only 100,000 pounds. The forward or operating car contains two 240-horsepower American-LaFrance gasoline engines direct connected to two Westinghouse 600-volt generators and two auxiliary 50-volt generators, air-conditioning equipment, and railway postal and baggage rooms. The air-conditioning apparatus, all located in the forward car, is Westinghouse-Sturtevant design. The two 4-wheeled steel tired trucks of lightweight cast steel were built by the Baldwin-General Steel Casting Co. Truck frames of the two 8-wheeled rubber trucks on the rear car are of stainless steel, shotwelded. These trucks also are on Timken roller bearings. Complete, the rear passenger-carrying car weighs 24,000 pounds. Each car is 68 feet long outside. To lessen weight, all tanks are stainless steel

made by mills on all prior shipments this year.

An advisory committee to support the study of railroad problems and advise wth O. S. Beyer, handling railroad labor research and relations, has been set up by Mr. Eastman.

China

DESIGNS and specifications for construction of a blast furnace and steelworks in Canton, China, by the Kwangtung government, are being completed by Arthur G. McKee & Co., Cleveland.

RFC funds to assist American manufacturers to sell equipment for the Canton works will be sought.

An analysis of the Kwangtung project by C. K. Ho, chief engineer of the mining division of the Kwangtung department of construction, lists a nearby deposit of iron ore, estimated at about 15,000,000 tons and analyzing 57.6 per cent iron, and a second deposit of 17,000,000 tons averaging 65.5 per cent iron. Since the blast furnace is to have a daily capacity of 250 tons, the first deposit is sufficient for 45 years.

Nearby reserves of coking coal total 90,000,000 tons, but these will not be available until the Canton Hankow railroad is completed, hence coking coal from north China at about $4 per ton, including transportation charges, must be utilized.

Limestone is said to be available at $2 a ton. Also within the province are manganese, tungsten, titanium, molybdenum, fireclay and quartz.

William A. Haven, vice president of the McKee company, has been in China to make the preliminary survey.

In addition to the 250-ton blast furnace the Kwangtung project includes a battery of by-product coke ovens, a small smelter for melting scrap, open-hearth furnaces, a combination rail, structural and blooming mill and a hard bar mill.

¶The central government in Nanking has been in touch with a German firm for the construction of a steelworks near Nanking. Shenshi province now has three representatives in Europe studying steelmaking. Szechnen province is also considering the production of iron and steel.

Production

STEEL production declined 4 points to 30 per cent last week, lowest rate since the last week of April. Breaks ranged from 2 points in New England to 13 at Youngstown. This week a further decline is indicated. American Iron and Steel institute, inaugurating a new service, estimated that production this week would average 31.8 per cent.

Youngstown operations sagged 13 points to 38 per cent last week and will be no higher than 35 this week. Independents are cutting ingot production sharply, but Carnegie mills still hold at 50 to 60 per cent.

¶Chicago steelworks declined 9 points last week to 45 per cent, and one blast furnace was banked, leaving 10 of the district's 36 steelworks stacks active. Indications point to a further recession this week.

¶Pittsburgh steel mills started on the toboggan last week when they lost 6 points, going to 29 per cent of capacity, and this week may see the rate as low as 25 per cent. One mill took off six open hearths and completely suspended; two other mills each took off four out of six. Tin plate leads finishing mills at 95 per cent, with strip, sheet and wire mills, in the order named, well below 40 per cent.

Three blast furnaces were banked in the Pittsburgh district last week, leaving 14 steelworks stacks on out of a possible 53; Carnegie banked two Duquesne stacks and National Tube one at Monongahela. Carnegie is operating 7 out of 32 stacks, American Steel & Wire at Donora 1 out of 2, Jones & Laughlin 4 out of 11, and Pittsburgh Crucible and Pittsburgh Steel each 1 out of 2. Bethlehem has 3 out of 7 stacks on at Cambria.

¶Cleveland-Lorain district operations jumped 3 points last week to 35 per cent, when the Corrigan, McKinney Steel Co. lighted another open hearth, making four at that plant active. Otis Steel Co. continues with two open hearths on and National Tube Co. at Lorain, with eight.

¶New England mills slumped 2 points to 80 per cent last week. One steelworks continued to operate all of its open hearths, although finishing operations have eased off. Stocks of semifinished steel are low.

¶Buffalo steel mills held their 24 per cent operating rate last week, but with only eight open hearths scheduled for this week a drop to 21 per cent is forecast.

¶Birmingham mills are barely holding the 30 per cent rate which has governed since the second week of October, but if Washington negotiations conjure up any rail business improvement is certain.

¶Detroit district operating rate remained at 55 per cent last week, with no change indicated this week, as the six open-hearth furnaces of Great Lakes Steel Corp. remained on, partly to stock ingots. The two new Great Lakes open hearths are being dried out. Ford Motor Co. continues to dry out open hearths, but no production is announced.

¶Wheeling district steelmaking operations eased 11 points to 36 per cent last week when one mill took off six open hearths, leaving only 13 out of 37 in the district on. This week operations will hold at 36 per cent, but if any change should develop it will be on the down side.

¶Eastern Pennsylvania steelmaking activity receded 3 points last week to 20½ per cent. Any improvement in the near future apparently rests with the railroads.

¶Canada in September produced 38,630 gross tons of steel ingots and direct steel castings, 21 per cent below the 48,659 tons of August. The 9-month total for 1933 is 266,829 tons; a year ago 257,843 tons. September pig iron total for Canada is 30,738 tons, against 35,233 tons in August.

Medals

DR. COLIN G. FINK, professor of electrochemistry at Columbia university, New York, has been elected to receive the Perkin medal of the Society of Chemical Industry for 1934. The award is for Doctor Fink's inventions in the fields of metallurgy and electrochemistry.

¶John Ripley Freeman, of Providence, R. I., is the posthumous winner of the John Fritz gold medal awarded jointly by the American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers and American Society of Civil Engineers.

News Oddities

TRAFFIC between Dusseldorf, Neuss and Cologne, in Germany, is traveling over a 328-foot experimental section of a steel-surfaced highway consisting of zigzag-shaped, high-edged grate rods running crosswise of the road, prepared in the factory in sections about 19 feet long and 3½ feet wide.

Sections are solidly anchored and fastened together with bolts or by welding and the voids are filled with macadamized tar. It is estimated that a highway 59 feet wide and 0.62 mile long would require 500 tons of steel, according to American Consul Simmons, at Cologne.

¶When the Peninsula Paving Co., Towle, Nev., appealed last week to the Nordberg Mfg. Co., Milwaukee, for rush shipment of 225 pounds of small machinery parts there was only one mode of transportation that would meet the time requirement. So the Milwaukee air mail hung up a new record for weight.

WINDOWS OF WASHINGTON

WASHINGTON

The Roosevelt Program, Pro and Con

TO SOME who have been skeptical, if not openly critical, of the President's thinking, his gesture toward Russia, followed closely by his declaration for a managed currency, removed the last solid ground under the republic.

Actually, there have been many more alarming developments in Washington this year.

As to Russia, no government in the world has been more stable and hence more entitled to recognition from the strictly diplomatic standpoint, while trade with her is a gamble involving less financial risk than some of the work-creating agencies which have been set up. In support of a dollar tied to commodities, the list of authorities is imposing.

But somehow, perhaps because a tradition that to take the hand of the soviets is abhorrent has been built up during the Wilson, Harding, Coolidge and Hoover administrations, the President's invitation to M. M. Kalinin to send a representative to Washington to talk things over has caused unusual ferment.

Coupled with the growing radicalism of labor, the certainty that this will be the hardest winter of the depression, the recent reaction in business, and resentment against NRA tactics, many fears for security have been expressed.

In fact, revolution has become a more frequently written and spoken word recently. Is revolution ahead? Then what has been happening in Washington since March 4? When a government—

Compels industrial leaders to come to Washington to be harried by organized labor and accept a flat on the conduct of their business and hours of work and rates of pay for labor;

Places three representatives on the governing bodies of all industries that are codified;

Makes salary reductions the price of government financial assistance, prescribes a limit for railroad officials, demands data indicating restrictions on all corporation salaries;

Subpoenas financial leaders to come to Washington to be pilloried by a $3000 prosecutor.

Directs banks to issue preferred stock to be taken up by Washington and thus virtually placing RFC in control of the banking business;

Pays farmers to plow cotton and grain and other crops under and to kill pigs, then taxes the food and clothing of city workers to obtain the necessary funds;

Imposes upon the issuance of new securities restrictions which make refunding practically impossible;

Spends millions to move unemployed from the city to the country;

Dictates to industry what prices must be reduced, as in the case of rails—

If this is not revolution—peaceful, of course, but revolution nevertheless—then what is it?

And a revolution connotes a dictator.

When a President, scarcely 48 hours in office, closes all banks with one stroke of his pen, when he pounds on his desk, as steel executives know, and demands that they adopt the checkoff system at their open-shop coal mines and reduce the market on rails; when he persuades congress to delegate to him many of its arbitrary powers; when he upsets all tradition concerning money; when he virtually specifies the prices at which retail stores shall sell—what more has Mussolini done?

NOTWITHSTANDING all this, and making generous allowance for the difficulties still ahead because labor has been given such a long tether, there probably are few who doubt that somehow the republic will muddle through.

There is no little opinion that if business had been left to its own devices, more and sounder progress would be evident today. Admittedly, the decisions of the President are hard ones, and as he has stated, he cannot look more than two or three days ahead.

Certainly the President believes that after demanding and promising action during his campaign, the November election was a mandate.

When Theodore Roosevelt wielded the "big stick" and the muckrakers were attacking business 30 years ago, it also was revolution. Levying a federal tax on incomes also was originally regarded as an invasion of rights and the beginning of the end.

Prohibition threatened, to some, to make personal liberty a forgotten pledge of the founding fathers. But the country survived all this, and grew and prospered until the excesses of 1929 forced an equivalent of adjustment.

Many have honest doubts whether, in making good his pledge of action, it was necessary for the President to become so radical and to make so many concessions to labor. There is one explanation in Washington which rings true. It is this:

By birth, training and environment the President is a patrician. His radio diction is proof of this. His natural instinct is toward the right rather than the left. But he believes that, from his vantage point in the White House, he sees signs of unrest not otherwise visible.

He views with great alarm the spirit which led a mob in Iowa a year ago to put a noose around a judge's neck. He believes he detects grave radicalism in labor. He sees the revolt of western governors against NRA and the sporadic farm strikes as an outcrop of serious discontent.

So the President, to appease this

insurgency and avert what he is convinced would be a calamity, is walking just as close as is humanly possible to the precipice without going over.

There is a mild reflection of this in the growing sentiment that, no matter how unsound or menacing some aspects of NRA appear to be, it may be better to plug for its success than to take a chance on the consequences of its failure. It is patent, however, that the morale of business has been lowered materially recently, due to despair over the business prospect under NRA.

IN ITS calmer moments, business must concede that the President's program has not been entirely one-sided.

Feeble as NRA has proved in snapping business back, in comparison with the ballyhoo for it, there are many potential benefits to industry from NRA codes.

Take steel, for example. Granting that $100,000,000 a year has been added to the industry's costs and that government supervision is well nigh intolerable, yet there may be a substantial offset if full advantage is taken of the possibilities for co-operation over the prostrate form of the antitrust laws.

Only time will tell how much firm extras will be worth to the industry, to say nothing of quantity differentials and higher base prices. Washington believes there are many producers who could not stand the strain if wide-open competition were to return and cut prices again become the sales argument of the industry.

While repugnant in principle, the policy of Washington in discouraging expansion of plant capacity—new processes and equipment excepted—may be a lifeline to existing capacity. Who would argue that new plate, sheet, strip or other mills are either justified or required at this time?

The aversion of the administration to excessive profit-taking and its sympathy for labor make it a certainty that for the next few years, at least, no large industrial fortunes are gong to be built up. It takes no socialist to agree with that. The dominance of Ford is over, temporarily at least, but steel producers will never know how much it cost them in pricing steel to automotive as well as to other consumers for Ford to be in position to wield his tonnage as a club.

Onerous as the securities act is, the pendulum has swung no farther toward restriction than it did toward laxity in 1929 and the preceding years. Steel did not succumb in 1929 because it was guilty of flagrant abuses, such as have been uncovered in the Pecora investigation; nor because it benefited by the methods of financing that have been uncovered. Steel was forced to bend before a storm created by others.

The doctrine that the heavy industries, such as steel, must profit only through volume and not through high unit prices is nothing for steel to worry about. It always has been a tonnage industry, and the long trend of prices in iron and steel, since the rebound from the 1921 depression, has been down.

Even the labor situation, grinding as it appears to be today, may react helpfully. Steel labor has not been overworked or underpaid or subjected to great hazards, as the public has been permitted to believe, largely as a result of the industry's indifference to public opinion. An educational campaign, in some ways paralleling that which put over safety, may be an outgrowth of the present stress, and will win public regard in the long run.

HOW far the President should go in fixing prices and controlling production in order to create and adjust business is probably a matter of irreconcilable viewpoints, especially for steel and oil.

To the President, the seriousness of the emergency transcends all other considerations, and for steel to balk at reducing prices 10 to 15 per cent for a million tons of rails and fastenings is obstruction in his eyes.

The railroads do not particularly want the rails at this time and the mills are reluctant to shave even a few dollars from a price that has not been remunerative, but putting men back in the mills or on rights-of-way is worth any sacrifice, the President is understood to maintain.

The principle of the White House becoming the price fixing instrumentality of the industry is the danger to steel. Already a leading automobile manufacturer is understood to have gone to the President and informed him that if steel can make a concession for a million tons of rails it ought to do likewise for the automobile industry, a still larger consumer.

By way of explanation, and not excuse, before the President's eyes constantly is the vision of congress convening in January and demanding a report of his stewardship. If it is not satisfactory, congress might decide to take matters in its own hands.

WHATEVER may be thought of the President's policies, his sense of showmanship surpasses that even of the first Roosevelt. When the Middle West farm revolt broke out a week ago three stories of tremendous news importance were released within four days—Russia, the Sunday night radio address relating to managed currency and gold, and the retail code. The farm revolt faded off front pages immediately. . . The release of towns of 2500 population and less from NRA observance in retail stores is the biggest retreat yet for General Johnson. . . .Washington did not relish that reference to "two great republics" in the Kalinin reply to the President, regarding Russia as trying to pull the cloak of the United States over it.

Charles F. Abbott, Executive Director of A.I.S.C., Dies

Charles F. Abbott, executive director of the American Institute of Steel Construction Inc., and an ardent crusader for better merchandising in the steel industry, died Friday morning, Oct. 27, at Doctors' hospital, New York, at the age of 57. Mr. Abbott had been ill for several months and on Oct. 20 underwent an operation, from which he seemed to be rallying, until late in the week a relapse occurred.

Charles F. Abbott

Funeral services will be held Sunday at Good Shepherd Presbyterian church, Sixty-sixth street and Broadway, New York, and interment will be at Concord, N. H. He is survived by his widow, Florence Smith Abbott, and two sons.

Mr. Abbott was born Jan. 24, 1876, at Concord, N. H. After attending grammar and high schools in Concord and a business college at Manchester, N. H., he went to Boston as an office boy for J. A. & W. Bird & Co. He advanced rapidly, became branch manager at New Orleans where he remained 12 years, and was recalled to Boston as general sales and advertising manager. For five years he was

(*Please turn to Page* 61)

European Steel in Revival; Great Britain Leads Advance

THE third quarter is usually characterized by a slowing of business, due to holiday periods. This year, however, this seasonal influence appears to have been less marked, at least in some countries of Europe where unmistakable signs of gradual trade revival can be noted. The improvement, in fact, had already begun to make itself felt since the beginning of the year, as was indicated in our previous review (July 31, p. 17).

Since the failure of the world economic conference in London in July there have been no further spectacular gatherings of statesmen and experts from the four corners of the world, with the result that no new false hopes have been raised, and leaders of industry have been able to apply their whole mind to solving their own problems. It may also be said that, while the world political melting pot has been simmering and none too gently, no important political disturbances have interfered markedly with the course of events. These remarks are not irrelevant, because recent experience has proved that industry and trade are sensitive to the influence of major economic and political conferences.

Budget Surplus in England?

Of all the countries of Europe, Great Britain undoubtedly has made the greatest stride toward business recovery. Unemployment figures have dropped by about 500,000 since January; wholesale prices are moving up, and production is expanding, some industries showing signs of almost normal activity. Returns just issued, relative to the nation's finances, show the lowest deficiency between revenue and expenditure since 1925. If, as can be expected, revenue collection continues on the same lines during the second half of the fiscal year, it may even be hoped there may be a budget surplus by next April. Apart from their direct influence on business, all these factors tend to give a new life to public confidence, and thereby stimulate buying and investment.

This optimistic outlook should not be taken to mean that this country has no more cause for anxiety. There are still many important problems to solve. Foreign trade returns up to August show lower figures than during the corresponding period of last year. Furthermore, Britain's welfare is dependent upon conditions prevailing in the rest of the world, and these are still far from being wholesome.

Among British industries that have made recent considerable advance in production, the steel industry is one of the more notable. Output of steel ingots and castings during the first eight months reached 4,301,600 gross tons, as against 3,482,500 tons in the corresponding period of 1932, an advance of 23.5 per cent. It is also to be noted that 73 blast furnaces were in operation Aug. 31, against 57 on Aug. 31, 1932.

Exports of iron and steel products are below last year's figures, but tend to catch up. For the period January-August, this year's exports totaled 1,214,823 gross tons, compared with 1,266,949 tons last year, a decrease of 4.1 per cent. Imports of iron and steel, on the other hand, decreased from 1,191,305 tons to 618,671 tons, a drop of 48 per cent. Last year at this time, exports of iron and steel exceeded imports by only 75,644 tons, whereas this year the excess of exports over imports amounts to 596,152 tons.

These figures indicate that domestic consumption is largely responsible for the increase of iron and steel production. Among large steel users, automobile manufacturers have been mostly to the fore. Constructional and mechanical engineering has also increased in volume, but shipbuilding remains well below normal.

On the Continent, the improvement since the beginning of the year is generally maintained, but without much further advance. Countries, like Belgium and Luxemburg, which depend mostly upon export trade, are not yet lifted from the depression.

In France the principal industrial concerns are fairly active and there is a decrease in unemployment. The textile industries are busier, but conditions in the metal industries are stationary and the outlook is not too promising. A number of large public works contracts are coming to completion, and there is no immediate prospect of further contracts of this nature being placed in the near future.

Export trade is considerably hampered by depreciation of the pound and dollar, the balance of trade is on the wrong side, and there is a considerable deficit in the budget. The manner in which French finances will be handled will have a considerable influence on business, and the solution of this problem at the present time is uncertain.

A NOTE of optimism long lacking from quarterly reports of conditions in European steel trade is sounded in the accompanying survey of conditions in Great Britain and the Continent over the past three months by Vincent Delport, European representative of STEEL. Much ground remains to be regained he says, but signs indicate the path now tends upward after long being beset by grave difficulties.

French Production Rises

During the first eight months the output of steel ingots and castings in France was 4,461,000 metric tons, compared with 3,703,000 tons in the corresponding period of last year, an increase of 20.5 per cent. There were 92 blast furnace stacks active Aug. 31, against 82 a year before. In Belgium, the output increased only from 1,862,980 tons in the first eight months of 1932 to 1,896,060 tons in the first eight months of 1933, an increase of 1.8 per cent, and in Luxemburg from 1,265,773 tons to 1,290,293 tons, an increase of 1.92 per cent. As previously noted, both the latter countries depend mostly on export trade; furthermore, their output has been affected by the European steel entente quota system more than was the case for France, whose production was relatively low in comparison with the Belgian and Luxemburg output.

It is interesting to note that since June, export prices of merchant bars, beams, plates, bands and billets have been fixed by the international steel syndicates, with the result that these prices have been raised to the level prevailing at the end of 1931. During the past three months the syndicates have been operating, some difficulties have been encountered, and the whole system is being perfected.

Reports from Germany are to the effect that internal economic conditions have improved. It is difficult to state how far this improvement is due to a natural development of business, as the government has taken a hand by imposing certain regulations and releasing contracts for the account of the railroads and public

STEEL PRODUCTION

Gross tons, 000 omitted

First Eight Months

	1933	1932	Per cent increase 1933 over 1932
Germany	4,705	3,728	26.25
France	4,390	3,644	20.50
Great Britain	4,302	3,482	23.50
Belgium	1,866	1,833	1.81
Luxemburg	1,269	1,246	1.85
Italy	1,144	872	23.80
Saar	1,082	927	16.27
Czechia	482	464	3.88
	19,240	16,196	18.70

works, with a measure of financial assistance.

Recent production figures show that the output of raw steel during the period January-August was 4,781,699 metric tons, against 3,789,077 tons in the corresponding period of 1932, an increase of 26.25 per cent. Exports of iron and steel dropped from 1,686,853 metric tons to 1,367,510 tons.

In Italy, the slightly better conditions starting early in the year were maintained throughout the summer. Steel production shows a substantial increase in comparison with that of last year. In Central Europe, particularly in Czecho-Slovakia, Poland and Austria, trade conditions are still far below the level prevailing in 1930, but in those countries also production is now increasing, and the trend appears to be toward a gradual improvement, although conditions in Austria are still distressing.

September Exports Decline as Scrap Movement Shrinks; Imports Rise

DECREASE of 10,575 gross tons in exports of iron and steel in September, with an increase of 8867 gross tons in imports, is not actually as poor a showing as indicated on the face of figures compiled by the iron and steel division, bureau of foreign and domestic commerce.

While exports fell from 119,374 gross tons in August to 108,799 tons in September, the decline in exports of iron and steel scrap alone was 29,608 tons, almost enough to account for the total loss three times over. Since scrap is a raw material and furnishes practically no manufacturing activity, loss in its export does relatively little harm.

On the other hand, exports of steel plates, skelp, galvanized sheets and steel rails showed fairly large increases over August. Galvanized sheets rose from 3091 tons to 12,241 tons, and steel rails from 2490 tons to 6165 tons, as examples.

Imports continued the steady rise which has been almost uninterrupted for nearly two years, last May offering the only break in the upward trend. The total for September is higher than any month in 1932 and 1933.

Over the nine months of 1933, exports have increased to 843,752 tons from 443,271 tons in the corresponding period of 1932. The same comparison for imports shows an increase from 280,394 tons to 307,828 tons.

Exports in September, 1933, were slightly in excess of three times those of September, 1932. Imports were slightly less than double those of the corresponding month in 1932.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1933		1932	
	Imports	Exports	Imports	Exports
Jan.	21,892	56,720	31,053	40,660
Feb.	19,748	63,936	26,738	40,492
March	22,114	80,567	41,031	49,927
April	28,061	100,395	35,935	58,086
May	26,295	123,069	39,751	80,477
June	34,368	102,581	34,494	52,081
July	52,805	88,311	18,005	52,558
Aug.	46,839	119,374	23,623	32,955
Sept.	55,706	108,799	29,241	36,038
9 mo.	307,828	843,752	280,394	443,271
Oct.	.....	.....	33,693	41,226
Nov.	.....	.....	34,924	56,041
Dec.	.....	.....	29,390	54,118
Total	.....	.....	378,282	594,691

ORIGIN OF SEPTEMBER IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferro-manganese
Netherlands	5,737	.....	.....
Norway	100	.....	5,850
Kwantung	118	.....	.....
Canada	6,425	.....	2,160
Japan	129	.....	.....
British India	7,236	.....	.....
Soviet Russia in Europe	.....	42,400	.....
Cuba	.....	5,400	.....
British W. Africa	.....	4,346	.....
Germany	.....	.....	398
Total	19,745	52,146	8,408

	Sheets, skelp and sawplates	Structural shapes	Steel bars	Hoops and bands
United Kingdom	3	10	96	29
Belgium	483	1,964	1,398	1,594
France	29	1,017	531	328
Germany	.....	170	381	469
Austria	.....	.....	4	.....
Sweden	.....	.....	148	41
Canada	.....	.....	1	.....
Total	515	3,161	2,559	2,461

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

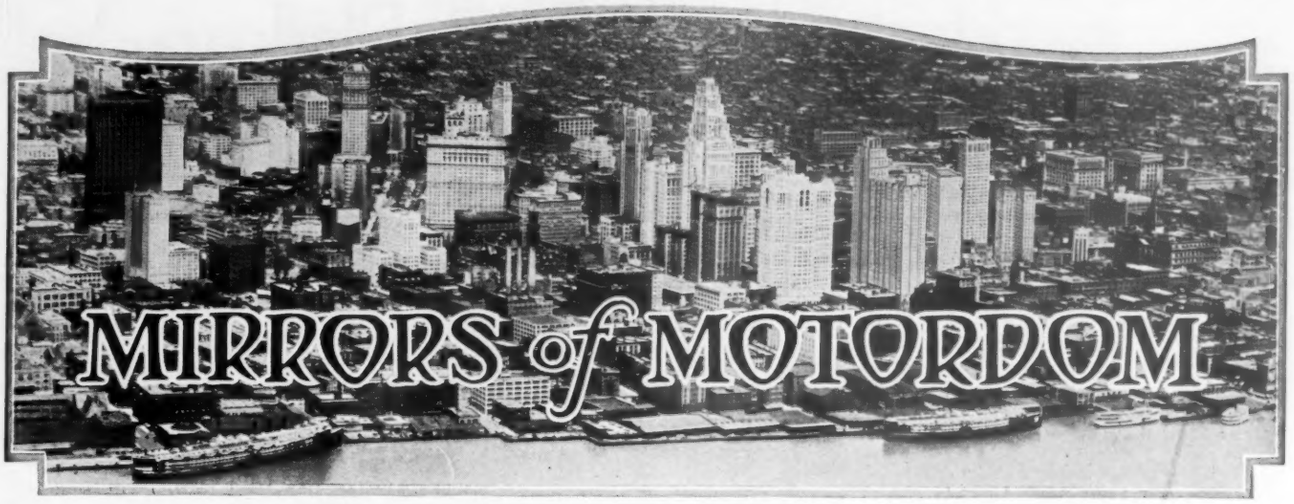
Gross Tons

Commodity	Sept., 1933	Aug., 1933	Sept., 1932
Pig iron	19,745	18,488	7,250
Sponge iron	145	100	6
Ferromanganese, spiegeleisen	8,408	4,889	1,163
Ferrochrome	3	.....	.....
Ferrosilicon	309	28	.....
Other ferroalloys	.....	.....	.....
Scrap	13,927	9,508	4,390
Steel ingots, blooms, etc.	126	121	91
Concrete bars	147	99	1,181
Hollow bar, drill steel	108	54	125
Merchant steel bars	2,559	1,518	1,193
Iron slabs	.....	.....	.....
Iron bars	16	53	38
Wire rods	693	1,174	862
Boiler and other plate	34	35	33
Sheets, skelp, saw plate	515	861	1,817
Tin plate	10	9	5
Structural shapes	3,161	2,894	3,109
Sheet piling	.....	.....	.....
Rails and fastenings	35	1,184	2,524
Cast-iron pipe, fittings	.....	148	.....
Welded pipe	1,035	369	239
Other pipe	366	176	190
Barbed wire	434	347	748
Round iron, steel wire	171	378	107
Telegraph, telephone wire	.....	10	.....
Flat wire, strip steel	143	168	88
Wire rope, strand	144	179	132
Other wire	108	189	48
Hoops and bands	2,461	3,303	3,062
Nails, tacks, staples	712	379	762
Bolts, nuts, rivets	3	18	12
Horse and mule shoes	17	35	26
Castings, forgings	171	125	29
Total	55,706	46,839	29,230

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	Sept., 1933	Aug., 1933	Sept., 1932
Pig iron	152	412	54
Ferromanganese, spiegeleisen	16	3	6
Iron and steel scrap	40,536	70,145	5,998
Ingots, blooms, billets, slabs and sheet bars	448	699	143
Bars, iron	50	47	28
Bars, steel	1,559	2,493	978
Bars, alloy steel	150	135	72
Wire rods	428	1,268	2,313
Boiler plate	48	52	38
Other plate, not fabricated	2,336	868	404
Skelp, iron or steel	4,821	1,184	212
Iron sheets, galvanized	39	78	139
Steel sheets, galvanized	12,241	3,091	1,964
Steel sheets, black	4,638	2,945	3,449
Iron sheets, black	235	354	160
Strip steel, cold rolled	654	827	391
Hoop, band and scroll iron or steel	1,075	1,112	652
Tin, terne plate	7,490	7,333	5,100
Water, oil, gas and other tanks, except lined	287	154	336
Shapes, not fabricated	2,077	2,594	993
Shapes, fabricated	1,712	1,144	410
Plates, fabricated	77	41	3
Metal lath	73	83	72
Frames, sashes and sheet piling	11	97	1,096
Rails, 50 pounds	6,165	2,490	789
Rails, under 50 pounds	112	461	75
Rail fastenings	528	760	73
Switches, frogs, crossings	29	75	60
Railroad spikes	99	290	38
Railroad bolts, nuts	30	55	21
Boiler tubes, seamless	504	337	208
Boiler tubes, welded	39	16	23
Casing and oil line pipe, seamless	2,244	1,214	2,138
Casing and oil line pipe, welded	1,267	133	55
Seamless black pipe, other than casing	260	94	28
Malleable-iron screwed pipe fittings	220	229	141
Cast-iron screwed pipe fittings	358	91	40
Cast-iron pressure pipe and fittings for	2,088	347	336
Cast-iron soil pipe and fittings for	228	643	119
Welded black steel pipe	1,657	1,568	1,973
Welded black wrought-iron pipe	59	58	23
Welded galvanized steel pipe	2,108	2,278	895
Welded galvanized wrought-iron pipe	37	50	315
Riveted iron or steel pipe and fittings	17	20	1
Plain iron or steel wire	929	1,447	327
Galvanized wire	1,918	1,873	164
Barbed wire	3,219	3,672	1,250
Woven-wire fencing	64	135	117
Woven-wire screen cloth	70	71	44
Wire rope	135	181	104
Other wire, manufactures	229	298	128
Wire nails	1,050	1,442	456
Horseshoe nails	51	60	71
Tacks	47	55	23
Other nails, staples	301	336	117
Bolts, machine screws, nuts and washers	327	240	223
Iron castings	591	495	200
Steel castings	21	91	52
Car wheels and axles	288	392	69
Horseshoes	5	47	3
Iron, steel forgings, n. e .s.	352	171	324
Total	108,799	119,374	36,034



Labor Hindering Heavy Dies

• • •

New Deal for Detroit GMC

• • •

Ford Show Crowds a Record

DETROIT

PROGRESS on new automobile models for 1934 reached the point last week where the strike of die and tool makers began to be a serious hindrance.

Many master dies and tools for small parts were withdrawn from Detroit shops several weeks ago when efforts to resume failed, and were placed in a zone roughly bounded on the east by New England and Philadelphia, on the south by Cincinnati, and on the west by Chicago and Milwaukee.

Now, however, the deadline for starting on dies and tools for such heavy and large parts as bodies and fenders is at hand, and few shops outside of Detroit are equipped to handle this business.

Employes of a number of independent local shops and of tool and die departments of automobile manufacturers have voted to return to work and some shops have resumed, but intimidation by strike leaders from other Michigan cities has interfered.

Unless these larger tools and dies get under way very shortly, some automobile manufacturers may be compelled to go to the New York show—unless it be postponed—with handmade models. A collateral handicap would be empty showrooms of dealers at a time when New York show publicity should be attracting potential buyers.

The labor situation within automobile plants is also causing much anxiety. Just as the tool and die makers' strike was strategically timed, so a tieup of departments feeding the assembly lines beginning about the middle of November would be a blow.

THIS unsettled labor situation has caused considerable wavering on changes, both body and mechanical, proposed for 1934, but beyond the postponement of independent front wheel suspension on several models no outstanding revision of plans is known.

Chrysler, which has canceled some orders for machine tool equipment, may not go so far with the new coil springs as seemed probable a month ago, and may drop semi-elliptical front springs for coil springs on only two models.

Within General Motors there also has been some indecision, but late last week the prospect still was that the entire line would adopt the new suspension for front wheels.

Confronted with a confused situation, both as regards labor and the retail market in 1934, some automobile manufacturers will go a little slower in throwing out the gearshift lever in favor of an automatic shift.

One of the largest interests, however, is making progress with a device which at this stage is known as the "infinite transmission" and is operated by means of several levers under the instrument board and a tachometer mounted on the board.

One of the merits claimed for this system is that it is possible to slip back to second gear and race the engine in that gear, without automatically reverting to high gear, for quick passing.

The automobile body without some window ventilating device will be almost a rarity in 1934. The goal of competing manufacturers has been to eliminate the center strip necessary to the Fisher no-draft system.

Ford, it is reported, has perfected an ingenious device. Windows raise and lower by a hand lever, as at present, but if the lever is turned after the window has been fully raised the window moves backward in a vertical plane and leaves an opening of several inches at the front.

Ford also is devoting considerable attention to a carburetor calculated to develop still greater efficiency than the present equipment. The objective of Ford engineers is a carburetor which will not only volatilize gasoline but will also suck the gasoline from the rear tank, thus eliminating the fuel pump.

It will be recalled that Mr. Ford, adamant against paying royalties, for years mounted his gasoline tank under the dash in order to obviate the necessity for a vacuum tank and the accompanying royalties, and went to a rear tank only when fuel pumps were devised.

A Detroit company manufacturing lubricating equipment is understood to have about completed experiments for Mr. Ford on a small diesel engine.

Some of the Ford V-8 engines are now equipped with a cast alloy crankshaft, but this is not yet standard equipment.

SEPTEMBER production of passenger cars and trucks in the United States, at 196,082 units, was more than twice the 84,150 assembled a year ago, and a substantial gain over the 140,556 units of September, 1931.

October production, while developing a bad slip from September, unquestionably also will be the best October since 1930. Going into the last few days of the month, the total is indicated as not a great deal over 100,000 units.

Ford especially has lost production ground the past few days, the daily rate at Fordson last week being estimated at 600 to 750 units, 5 days. Assemblies, however, exceed this figure as banks of parts have

been accumulated. Ford still has heat in several open-hearth steel furnaces but a decision on starting them probably will be postponed until the retail market improves.

Making allowance for a tapering-off in the last week of the month, estimated October output is 41,000 for Chevrolet, 5000 for Pontiac and 200 for Cadillac, about 46,000 for General Motors. Olds and Buick assembly lines are down. Some Chevrolet departments already are working on 1934 parts, but the 41,000 figure represents assemblies of the present line.

Plymouth has been operating in October at a rate of about 18,000 for the month, Dodge at about 9000, DeSoto at 1700 and Chrysler at 500, or a total of slightly under 30,000 for all Chrysler units. It is believed in Detroit that Chrysler has encountered more delays on new models than any other manufacturer, and recently enlarged its engineering staff.

In the first two weeks of October Ford assembled 22,000 units, but has gone down so rapidly the past week as to make 30,000 to 35,000 the top for this month. The Packard rate is about 250 weekly. Hudson-Essex is down.

In some lines a shortage of cars is developing, as material specifications for completing runs on 1933 models were issued before fall buying was seen to be exceptionally strong.

WITHOUT a doubt, General Motors policies will be thoroughly overhauled as a result of the appointment of W. S. Knudsen, godfather of Chevrolet, as executive vice president for all General Motors automobile manufacturing operations in the United States.

Second only to Alfred P. Sloan Jr., Mr. Knudsen, an experienced operating man, will make decisions on the ground in Detroit which formerly had to be referred to executives in New York whose viewpoint, to some extent at least, was the financial one.

Having built up Chevrolet to a leading position in the low price field, and having made Pontiac a strong contender in its field, Detroit expects the Olds and Buick divisions to be reorganized and energized. Olds, as noted last week, is bringing out a lower price six next year in addition to the eight in its present class.

Mr. Knudsen, who came to this country as an immigrant boy from Copenhagen, formerly worked in steel mills in Buffalo and Pittsburgh, went with Henry Ford when the latter bought a Buffalo seamless tube mill and is one of the few former Ford officials who can say that he resigned, has severed all relations with Chevrolet.

Heading up Chevrolet as general manager is M. E. Coyle. Now general manager of Buick is Harlow H. Curtice, of Olds C. L. McCuen, and of Pontiac H. J. Klingler. There are no presidents of these divisions.

The B O P setup, co-ordinating Buick, Olds and Pontiac sales, is being abandoned, having served its purpose of strengthening dealers in these lines during the darker days of the depression.

Presumably, the characteristics which made Chevrolet and Pontiac such successes will be continued, now that all manufacturing operations, including Cadillac-LaSalle, are co-ordinated.

It is possible that even at this late stage that the new management will exert its strength on the side of the lowest prices possible, and there is some speculation that reductions rather than increases may be the rule for 1934. At this time, of course, prices have not been determined.

Centralized purchasing for all General Motors automobile producing units also is a possibility.

FORD staged in convention hall from Oct. 21 to 28 what is conceded to be the most successful show in the history of Detroit. Exhibits—many of them working—depicted the various products entering into the manufacture of Ford cars and in some cases the process of production.

Daily attendance averaged over 90,000 persons; the record for one day was 102,058 persons, and the record for one hour's entrances 21,308.

One exhibit depicted every type of wheel ever mounted on any Ford. Bodies were welded and assembled, upholstery woven and stuffed, the evolution of Ford crankshafts shown by examples of all types used, the manufacture of bessemer and stainless steel explained. There were 175 exhibits, and 150 tons of machinery was moved into the hall.

To visualize the strength of steel spoke wheels, a fully-equipped Ford was suspended on a spoke. A combined weight of 3367 pounds was mounted on top of a 1933 model. An exhibit of old automobiles was grouped around a replica of the old workshop on Bagley avenue where Mr. Ford built his first car.

The new Nash light car is to have a distinctive name, and the revised six is now a valve-in-head, twin ignition car like the higher price series . . . . The code governing trade-in values was to be effective Nov. 2, but has been delayed several weeks pending the printing of a guide book listing all used car values . . . . Lines of progress of the automobile and airplane are converging, according to Frank S. Spring, chief body engineer and stylist of Hudson, and they will eventually coincide, meaning that automobiles will fly and airplanes will be utilized on highways.

Died:

JOHN HALTER KILLINGER, 74, who at the time of his retirement several years ago was president of the Treadwell Engineering Co., Easton, Pa., in Pelham, N. Y., Oct. 24. He was a mechanical engineer, and also formerly was associated in an executive capacity with the M. H. Treadwell Co., steel castings and fabricated steelwork.

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Charles F. Feine, 45, treasurer, August Feine & Sons Inc., Buffalo, steel fabricators, in that city, Oct. 19.

□ □ □

Thomas W. Day, 80, who at one time operated the Denver Iron Works, in Denver, Colo., Oct. 20.

□ □ □

Morris R. Johnson, 50, assistant superintendent of the mill department, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., in that city. Oct. 16.

□ □ □

Ole J. Lunde, 68, pioneer manufacturer of nonferrous castings, in LaCrosse, Wis., Oct. 14. He was born in Lillehammer, Norway, and came to America in 1887, establishing his foundry at LaCrosse in 1890.

□ □ □

John H. McDermott, 64, president, McDermott Bros. Co., steel plate work, Allentown, Pa., in that city Oct. 6. His firm specialized in the manufacture of boilers for cement works. He was associated with other commercial and industrial enterprises in Allentown.

□ □ □

Charles Francis Conn, 61, secretary and treasurer, J. G. White Engineering Corp., in New York, Oct. 22. He was a member of the American Society of Mechanical Engineers, a fellow of the American Institute of Electrical Engineers, and was identified with other local and national engineering societies.

□ □ □

Henry George Meister, 73, in Crawfordsville, Ind., Oct. 9. On Jan. 1, 1930, he resigned as assistant superintendent, Mid-States Steel & Wire Co., completing 50 years' connection with the iron and steel industry, 27 years of which were spent in the plant of Crawfordsville Wire & Nail Co., which was consolidated with the Mid-States company. He formerly was identified with the Cambria Steel Co., at Johnstown, Pa.

□ □ □

Carl Clausen, 71, mechanical engineer, in Lowell, Ariz., Sept. 29. Born and educated in Germany, he came to this country to operate a mill at Hillsboro, N. Mex., later becoming consulting engineer for the Scott Iron Works at San Francisco

(*Please turn to Page* 61)

Industrial Men in the Day's News

H. U. Herrick, President, Mechanical Press Builders Association

He is recognized as an authority on design and construction of mechanical presses.

He has had broad experience in manufacturing industries employing automatic equipment.

Joining a New York firm of power press builders in 1924, he now heads the organization.

HOWARD U. HERRICK, who, as announced in STEEL recently, was elected president of the newly organized Mechanical Press Builders association at a meeting in Detroit, is an authority on mechanical presses, and an executive who has had much to do with their production.

He is recognized as one of the best informed men in this country on design, construction and use of all types of power presses, thread rolling machines, and dies and automatic feeds for such machines.

Mr. Herrick was born in Syracuse, N. Y., and after completing his school education went to work for the Smith-Premier Typewriter Co. The typewriter industry was developing rapidly and in this expansion was making more extensive use of automatic machinery.

Mr. Herrick subsequently joined the Syracuse Time Recorder Co., and then went with the C. E. Lipe Corp., Syracuse. Packard Motor Car Co., Detroit, next engaged him, where he had closer contact with the automotive industry. Later he took charge of the manufacture of steering gears and gear shifting controls for the Brown-Lipe Gear Co., Syracuse. He became works manager and had entire charge of the gear company's plant for five years.

In 1924 Mr. Herrick went with the V & O Press Co., Hudson, N. Y., builder of power presses, as vice president and general manager; in 1926 was elected president, and in 1928 was assigned the additional duties of treasurer.

□ □ □

J. A. Long, general manager, and Noel Beddow, superintendent of blast furnaces, Woodward Iron Co., Woodward, Ala., have resigned.

Leo Ehrman has been appointed furnace superintendent for the Woodward company. He formerly was with the Sloss-Sheffield Steel & Iron Co.

□ □ □

C. D. Marshall, who was chairman of the board, Koppers Co., Pittsburgh, has been elected chairman of the executive committee.

H. B. Rust, formerly president, has been made chairman of the board.

John F. Tierney, vice president, now is president.

J. P. Williams Jr. has been made vice president.

□ □ □

Charles G. Allen, general manager, Charles G. Allen Co., Barre, Mass., has been elected a member of the executive committee of the Associated Industries of Massachusetts. Other members of the committee recently elected include: George S. Barton, president and treasurer, Rice, Barton & Fales Inc., Worcester; R. S. Clark, treasurer, Package Machinery Co., Springfield; Frank P. Cox, works manager, West Lynn plant, General Electric Co.; Harry E. Gould, general manager, Bethlehem Shipbuilding Corp. Ltd., Quincy; George C. Hadley, treasurer, James Hunter Machine Co., North Adams; Philip M. Morgan, treasurer, Morgan Construction Co., Worcester; Frank Mossberg, president, Mossberg Pressed Steel Corp., Attleboro; A. B. Reynders, works manager, Westinghouse Electric & Mfg. Co., East Springfield; J. F. Tinsley, vice president and general manager, Crompton & Knowles Loom Works, Worcester; W. Howard Townsend, treasurer, N. E. Pressed Steel Co., Natick.

□ □ □

M. C. Semour, secretary-treasurer, Transue & Williams Steel Forging Corp., Alliance, O., has been elected a director of the company.

□ □ □

Rob Roy MacLeod, who has been public relations manager for the Buffalo division of the General Electric Co., has been made vice president, general manager and a director of the Bradford Electric Co., Bradford, Pa.

□ □ □

Walter N. Cargill, 185 Devonshire street, Boston, who is sales agent for the Air Preheater Corp., has also been appointed by the Superheater Co., New York, as its sales agent in the New England states for stationary superheaters, economizers, furnace water walls and other steam plant equipment.

□ □ □

W. S. Gain, 416 Lafayette building, Buffalo, has been appointed district representative for the magnet department of the Ohio Electric Mfg. Co., Cleveland.

E. A. Thornwell, 217 Whitehall street, Atlanta, Ga., also has been appointed district representative for the magnet department of the company.

□ □ □

J. F. Tholl, formerly general manager of the Green Island, N. Y., plant of the Ford Motor Co., has been made vice president, in addition to being general manager, American Tool & Machine Co., Hyde Park, Boston.

T. A. Bryson, who was chief engineer of the Tolhurst Machine Works prior to its reorganization, has become chief consultant to the American Tool & Machine Co., on centrifugals.

□ □ □

Charles J. P. Hoehn was elected president of the Pacific Coast Founders association at the eighth annual meeting in San Francisco, Oct. 19. F. G. Johnson was elected vice president, Charles A. Kingwell treasurer, and Maurice S. Greenberg secretary. Mr. Johnson, Mr. Greenberg and Elmer S. Anderson were re-elected directors. George L. Kennard continues as manager.

EDITORIAL

Rail Price Conflict Due To Lack of Understanding

AS THIS is written the final outcome of President Roosevelt's attempt to arrange for the purchase of rails and track materials by the railroads is not known. Railroad Co-ordinator Eastman has intimated that under the circumstances now prevailing, steelmakers should reduce their price for standard rails to $35 or lower. He has hinted that if the railmakers believe that this reduction is prohibitive, they should open their books to government inspection to prove their point.

Mill interests responded to Co-ordinator Eastman's invitation by quoting $37.75, a reduction of $2.25 from the previous price of $40. At the $37.75 quotation the mills are offering standard rails—a highly specialized product—at 1.685c per pound as compared with the prevailing prices of 1.75c for bars, and 1.70c for plates and shapes. To those who are familiar with the greater precision required in making rails as compared with that obtaining in the production of bars, plates and shapes; the unusually large ingot discard in making steel for rails; the extra expense for finishing and the provisions in rail purchase contracts for the return of unused rails, the price of $37.75 represents a considerable concession on the part of the rail mill interests. It is a concession brought about solely by the willingness of railmakers to yield to the President's plea for co-operation and not by admission that $37.75 is a just price.

Public Has Gained Erroneous Impression That Stable Price Plan Is Iniquitous

The unfortunate difference of opinion as to price has grown out of two misunderstandings. The first is the widespread belief that the stabilized rail price is an iniquitous arrangement. The second is the idea, apparently held by those high in government authority, that the ratio of railmaking capacity to rail consumption is too high and can be corrected most readily by cutting prices.

The first misunderstanding is the result of the public utterances of Senator Couzens and others, who for years have been attacking the "fixed" price policy on rails. They have convinced the public that the stable price system enables the mills to profiteer at the expense of the railroads. They even infer that the railroads and steelmakers connive to keep the price of rails unduly high.

Informed authorities in the steel industry and in railroad circles know these charges are false but have been unable to put the truth before the public effectively. The "fixed" price policy actually has saved the railroads millions of dollars. Under the American system (stable price) the average rail price during the past 28 years has been $37.65. Under the fluctuating price system prevailing in England the average price during the same period has been $43.73. In 16 of the 28 years the American fixed price has been lower than the English fluctuating price. Moreover, in the postwar period, when English rails soared to a yearly average of $111.66, American rails averaged $52.40. The highest price for American rails in the entire period was $55, the price fixed by the government in 1918.

Railroads Paid 400 Million Less Than If They Had Bought at English Prices

From 1906 to date railmakers in the United States have sold slightly more than 70,000,000 tons of rails. Their customers, the railroads, paid $425,600,000 less for these rails under the fixed price system than they would have been required to pay at English fluctuating prices. In the face of these facts, it is difficult to understand how the stabilized price plan can be attacked on the grounds of profiteering, or how the $40 price can be appraised as "too high."

As for rail mill capacity in relation to consumption, it is well known that the nominal capacity is higher than production in recent years. The stated capacity of the six railmakers totals 3,552,000 tons annually. Compared with production of 402,566 tons in 1932 it appears to be ridiculously high, but contrasted with the 3,217,649 tons produced in 1926 it does not seem to be far out of line. Moreover, capacity has been scaled down drastically in the past two decades, and probably will continue to be reduced as occasion demands and as conditions permit.

The point of the present wrangling over prices is that the general public has been misled by half truths and misinformation emanating from enemies of the steel industry. Steelmakers made the mistake of not placing their case before the public effectively.

Today the industry again is on the point of paying dearly for its failure to appraise public opinion at its real value.

THE INDUSTRIAL DIAL

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OCTOBER has proved to be a month of denouement for many important phases of government recovery policy. It has witnessed an outbreak of serious criticism by farmers that NRA has neutralized the expected benefits from AAA, a series of strikes caused primarily by the ambiguity of section 7a in NIRA, widespread uncertainty due largely to the absence (until Oct. 22) of a clear-cut definite statement of the governments' monetary policy, and many other minor crises in the administration of the recovery program.

Naturally business could not advance under such disturbing circumstances. The decline in the federal reserve board's index of industrial production, which started in August, continued into October. Commodity prices have fluctuated uncertainly. Steelworks operations have slumped from the July peak into the lower thirties in percentage of capacity.

However, such declines are not common to all lines of activity. For instance, building construction, which had made a pitiful showing throughout most of 1932, gained sharply and against the seasonal trend in August and September. Revenue freight car loadings in the week ending Oct. 14 were the highest in 1932 with the exception of the week ending Sept. 2. Seasonally the current showing of freight traffic is not as favorable as in the third quarter.

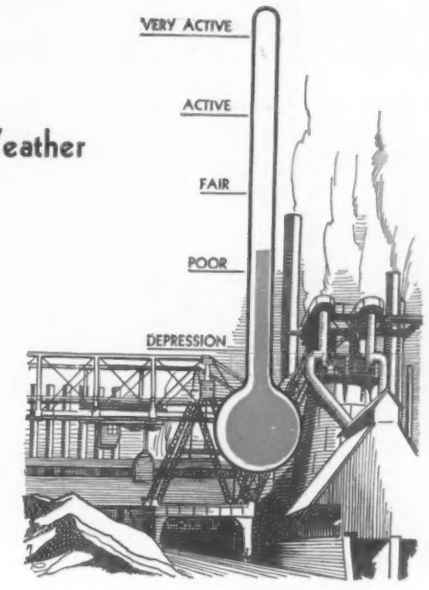
A net result of the failure of business generally to respond to the usual fall influences is the recent new wave of governmental efforts to pump more oxygen into the patient. Modifications of NRA, speeding up of PWA, purchase of new gold at regulated prices, efforts to free money from closed banks, negotiations for sales to Russia, attempt to force rail purchases, etc. all are expedients designed to put new life into business —to make up in other ways for what NRA was expected to do, but which, in a large measure, it could not do in the brief time it has been operative.

Many industrialists will consider it significant and perhaps encouraging that the government, after closing its eyes to the problem of money and credit (while NRA was in the limelight)

Industrial Weather

TREND:

Uncertain



The Barometer of Business

Industrial Indicators

	Sept., 1933	Aug., 1933	Sept., 1932
Pig iron output (Daily average, tons)	50,264	59,137	19,788
Machine Tool Index	55.7	50.4	27.7
Unfilled orders (tons)	1,775,740	1,890,444	1,985,090
Ingot output (Daily average, tons)	88,884	107,430	38,148
Dodge Bldg. awards in 37 states (sq. ft.)	13,380,700	13,002,200	13,513,900
Automobile output	201,890	242,559	86,483
Coal output, tons	29,500,000	33,910,000	26,266,000
Business failures, number	1,116	1,472	2,182
Business failures, liabilities	$21,846,906	$42,776,000	$56,127,634
Cement production, Bbls.	....	8,223,000	8,189,000
Cotton consumption, bales	449,486	588,570	492,742
Car loadings (weekly av.)	640,910	625,679	620,750

Foreign Trade

	Sept., 1933	Aug., 1933	Sept., 1932
Exports	....	$131,000,000	$132,037,000
Imports	....	$155,000,000	$98,411,000
Gold exports	....	$81,473	$60,000
Gold imports	....	$1,085	$27,957

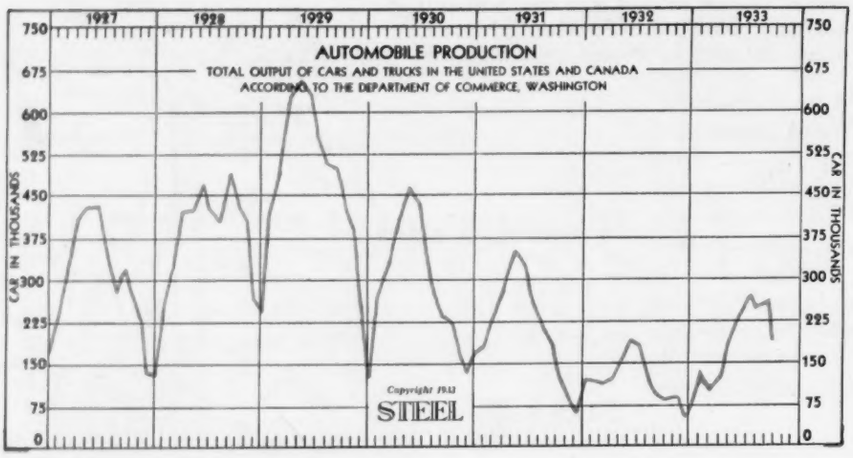
Financial Indicators

	Sept., 1933	Aug., 1933	Sept., 1932
25 Industrial stocks	$136.44	$135.86	$95.42
25 Rail stocks	$38.51	$40.63	$25.10
40 Bonds	$74.26	$77.18	$68.50
Bank clearings (000 omitted)	$16,665,333	$16,408,656	$20,390,292
Commercial paper rate N. Y. (per cent)	1½	1¾	2¼
*Commercial loans (000 omitted)	$8,540,000	$8,533,000	$6,218,000
Federal Reserve ratio, per cent	66.1	67.5	60.8
**Railroad earnings	$60,978,217	$64,307,068	$27,985,138
Stock sales, N. Y. stock exchange	43,319,334	42,466,352	67,424,653
Bond sales, par value	$231,353,500	$216,100,700	$246,221,000

*Leading member banks Federal Reserve System.
**August, July and August respectively.

Commodity Prices

	Sept., 1933	Aug., 1933	Sept., 1932	Monthly Av. 1913
STEEL's composite average of 14 iron and steel prices	$31.30	$30.04	$29.32	$26.32
Bradstreet's index	$9.05	$8.99	$7.28	$9.21
Wheat, cash (bushel)	$1.03	$1.07	70c	92c
Corn, cash (bushel)	64c	66c	46c	51c
Petroleum, crude (Bbl.)	98c	87c	90c	$2.50



September, 1933	201,890
August, 1933	242,559
September, 1932	86,492

now is shifting its attention back to monetary policy as the key to recovery. Whatever plan for recovery is attempted, it cannot succeed unless it encourages the public to invest its capital. Had NRA induced rather than discouraged investments, its achievements to date would have been more promising.

There is no question but what the nation is proceeding on the rule of trial and error. Success under such a system necessarily depends upon the ability of the government to recognize mistakes quickly and to act promptly to rectify them. Fortunately the present administration has demonstrated that it is "quick on its feet." This faculty may prove to be its best asset.

Where Business Stands

Monthly Average, 1932 — 100

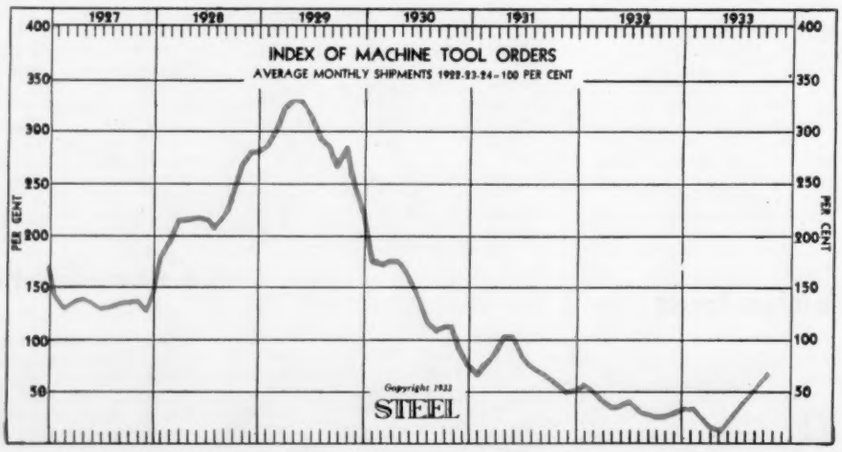
	Sept., 1933	Aug., 1933	Sept., 1932
Steel Ingot Output	211.8	255.9	90.8
Pig Iron Output	212.1	249.5	83.5
Freight Movement	118.0	115.2	114.3
Building Construction	102.9	100.0	103.9
Automobile Output	169.2	184.4	72.4
Wholesale Prices	127.5	126.6	102.5

September Automobile Output Declines; Shows Gain Over Last Year

Production of passenger cars and commercial motor vehicles in the United States and Canada during September declined 40,676 units. According to the latest report from the United States department of commerce, the September output totaled 201,890 units and compares with 86,492 units produced in September last year. In the first nine months of this year production in the United States and Canada totaled 1,729,456 units, of which 1,672,767 were produced in this country and 56,689 in Canada. In the same period last year production totaled 1,208,616 units, of which 1,155,066 were produced in the United States and 53,550 in Canada.

Machine Tool Industry Continues Upward Movement in September

Despite the confusion and uncertainty wrought by disputes over code provisions and strikes the machine tool industry holds its own amazingly well. According to the National Machine Tool Builders association, the three-month moving average for September was 55.7, a five point rise over the preceding month and compares with 27.7 in September a year ago. Both shipments and unfilled orders continue to show encouraging gains, the latter advancing nearly 12 points.



	Per Cent
September, 1933	55.7
August, 1933	50.4
September, 1932	27.7

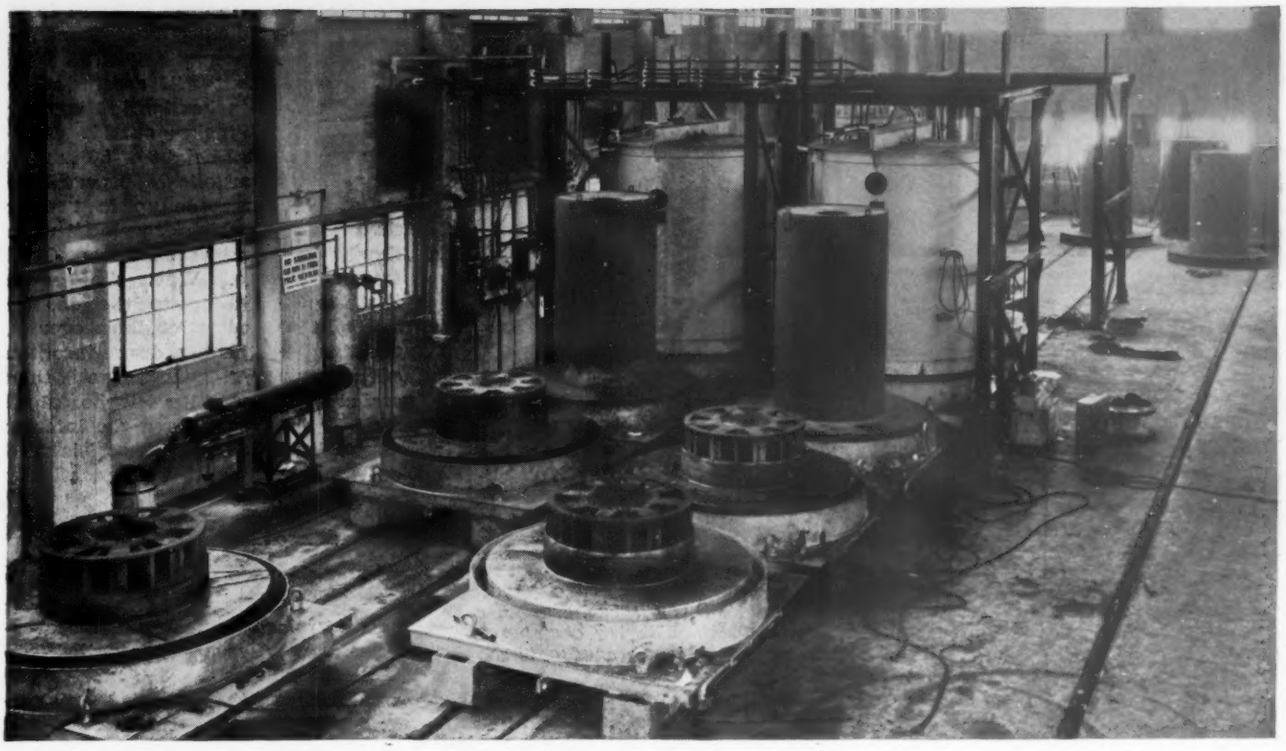


Fig. 1—A general view of the cold-rolled strip steel annealing department showing two of the three electric, bell-type controlled atmosphere furnaces in operation. Two charges with hoods in place and ready for heating are standing before the furnaces. In front of these are four empty bases on which the coils of strip are stacked

COLD-ROLLED STRIP BRIGHT ANNEALED IN CONTROLLED GAS ATMOSPHERE

UNIFORMITY, freedom from decarburization and oxidation, and bright finish in the annealing of cold-rolled strip steel have been attained by an eastern producer of this material through the installation of bell-type, controlled atmosphere, electric annealing furnaces. This equipment has relegated to obsolescence practically all of the previously used annealing pots and all fuel-fired furnaces in the plant but one have been dismantled. Only two men are required to operate the entire annealing department, and one of these serves as craneman.

The Thompson Wire Co., Boston, in whose plant this equipment has been installed and recently placed in operation, specializes largely in the production of bright and highly-finished cold-rolled strip steel. A considerable portion of the strip is of special analysis steels, and the company has developed certain individual practices with its new annealing equipment which comprises three bell-type furnaces each having an approximate capacity of 200 tons a month. The superstructure provides space for a fourth furnace which was purchased recently. A general view of the annealing department is shown in Fig. 1.

BY L. E. BROWNE
Associate Editor, STEEL

All furnace equipment was supplied and installed by the General Electric Co., Schenectady, N. Y., and comprises, in addition to the furnaces proper, fifteen 16-gage welded, heat-resisting steel cylindrical hoods, five to each furnace, used for covering the furnace charges. Each hood rests on a car-type semirefractory base upon which the charge is built up and through which the controlled atmosphere is introduced. The nature of these hoods and bases is such that little material other than the charges has to be heated, thereby increasing the sizes of the charges appreciably.

The charge is heated uniformly throughout and the heat control is automatic. For this reason, Rockwell hardness tests on high carbon steels reveal remarkable uniformity. An average charge is 7500 pounds of strip. The annealing time depends upon the steel analysis, weight of

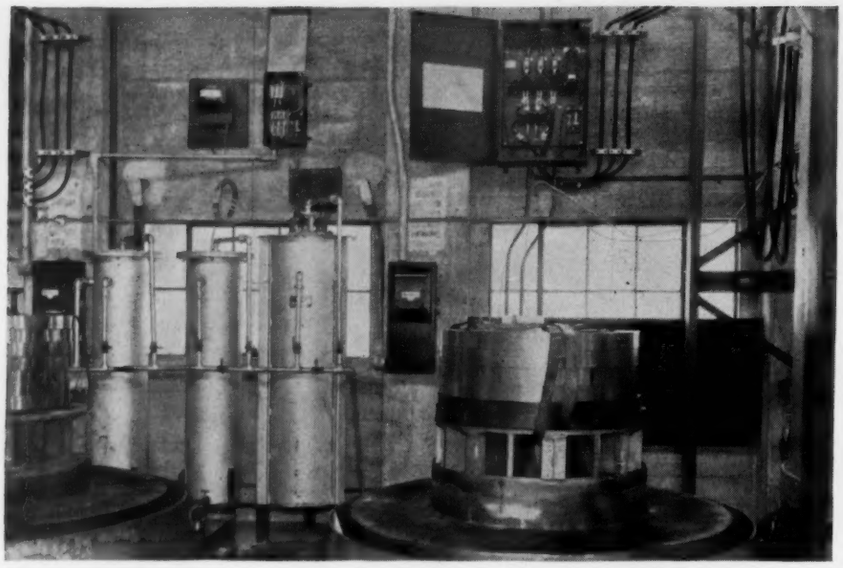


Fig. 2—The controlled atmosphere for annealing is either purified city gas or dissociated ammonia. The gas equipment, shown in the left background, consists of a 10-kilowatt purifying chamber and two chemical drying chambers. A furnace base, built up with coils of strip to about one-third of a charge, is shown at the right

charge, thickness of strip and carbon content, and varies from 6 to 14 hours. As compared with the fuel-fired method, this annealing time is reduced greatly. Under the fuel-fired system with annealing pots, the charge per heat was about half the present load and the material heated in proportion to the charge was 2 to 1, sometimes more.

A charge is built up on the semi-refractory base in three sections and controlled atmosphere within the oil-sealed hoods is maintained during both heating and cooling, thereby protecting the work from all oxidation. The controlled atmosphere is obtained from either one of two equipments. One equipment, shown in Fig. 2, is a gas purifier and utilizes city gas, the gas first passing through a calcium-chloride chamber to remove moisture and then over heated cast-iron chips for the removal of oxygen, sulphur and other impurities. The other equipment is an ammonia dissociator which produces a more strongly reducing atmosphere.

Liquid Seal Employed

Each furnace has but three major parts—the base; the hood; and the bell, or furnace proper. As stated previously, five bases and five hoods are provided for each furnace. The base, which moves on a narrow-gage track, is of a semirefractory nature and is surmounted by a cast-steel gridwork upon which the charge rests. Extending completely around the base is an oil compartment which seals the flange of the hood. The hood, of 16-gage corrosion-resisting steel, is 72 inches high, 40½ inches in diameter, with a deep center bore 12 inches in diameter; and has a wide flanged bottom extending into the oil seal. The furnace proper, which is 74 inches in outside diameter and 78 inches high, consists of 3/16-inch plate enclosing a section of insulating brick. A sectional view of the furnace is shown in Fig. 3.

Heating units are of chrome-nickel strip and are in two main sections, the outside unit, which is supported by hooks fastened in the insulating brick, and the inside or center unit, which extends down into the center bore of the hood and charge. Each furnace is rated at 90 kilowatts and operates on 3-phase, 220-volt, 60-cycle alternating current, reduced from the 14,000-volt entry by a transformer system.

The equipment will accommodate charges of 16 inches inside diameter and up to 38 inches outside diameter with a total height of 56 inches. An average charge is 7500 pounds in weight and is made up in two or three sections which are placed upon the base by means of an overhead traveling crane. When the charge has been built up to the desired height, the hood is let down over it, the flange extending down into the oil compartment. The flange is then sealed with from 2 to 4 inches of oil and all air purged from the interior of the hood. Oil for the seal is used over and over again with practically no loss.

Furnace Lowered Into Place

The charge is now ready for the annealing operation. First, the furnace is raised by means of the overhead crane, the charge is pulled into place by means of a motor-driven windlass, and the furnace then slowly lowered around the charge and onto the base. The current then is turned on. Two furnaces in operation are shown in Fig. 4.

While the charge is being heated, a steady flow of gas is maintained, the exhaust gases being burned at the exhaust or outlet end. The heating period is from 6 to 14 hours for low-carbon steels; for high carbon steels, however, 6 to 10 hours additional is necessary for spheroidization. When the charge is annealed properly, the furnace is lifted and the finished charge pushed from beneath it by contact with the incoming charge. The current can be turned off from one charge, another charge

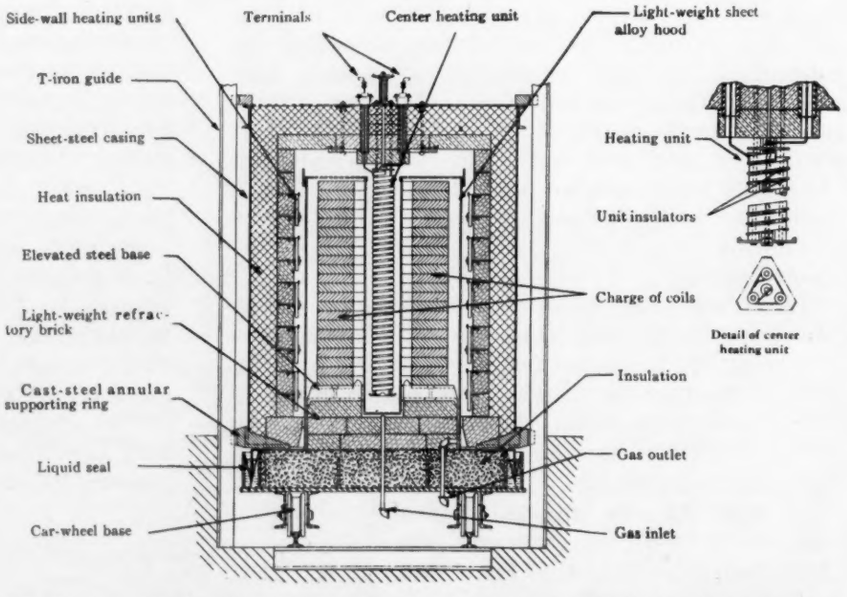


Fig. 3—A vertical section of the electric, bell-type, controlled atmophere furnace showing the charge and hood in place on the car base

brought into position, and the current again turned on in less than 3 minutes. Thus, the furnace loses very little heat in the change, and the effectiveness of its insulation is attested to by the fact that the hand can be placed on the exterior of the furnace shell with an interior temperature of 1400 degrees Fahr.

After the charge is removed from the furnace, the cooling period before lifting of the hood varies from 30 to 50 hours, the exhaust valve being closed and a slight pressure of gas being maintained. In this way, air is excluded throughout the entire annealing cycle, which is from 36 to 72 hours, depending upon the weight and type of charge.

In annealing high-carbon steel in controlled atmosphere, temperature uniformity is highly desirable for uniform hardness, therefore, the temperature variation throughout the charge is held within the narrow limits of plus or minus 10 degrees Fahr. Through this close control of temperature and the concentration of heat on the charge with little additional material being heated, the annealing cycle is reduced greatly from previous practice. Furthermore, as a result of proper control of the atmosphere, high-carbon strip is finished without a trace of surface decarburization.

Most Heat from Wall Elements

Roughly, about two-thirds of the heat to the charge comes from the outside wall heating elements and about one-third from the center heating unit inside the charge. Central heating units are wound on rods of heat-resisting steel. The liquid seal, ordinary oil, is an important feature. With the lip of the hood extending into the oil, the inner atmosphere is completely sealed from the outer air. By elimination of the customary sand seal, strip can not become sand scratched and the annealing room always is clean because of the absence of sand dust and scale from pots. In comparing the electric annealing furnace with the fuel-fired furnace from a labor standpoint, the fact that only two men, including a crane operator, are required to operate the furnaces of the Thompson Wire Co. is noteworthy.

With the fuel-fired furnace, the ratio of the weight of the auxiliary equipment to be heated, such as pots and borings, to the weight of the charge was at least 2 to 1, while with the electric furnace this ratio is reduced to less than 1 to 1. From the uniformity of hardness and brightness of finish standpoints, the electric furnace with its heating from both the inside and outside of the charge, close temperature regulation, and the controlled gas atmosphere, is proving eminently satisfactory.

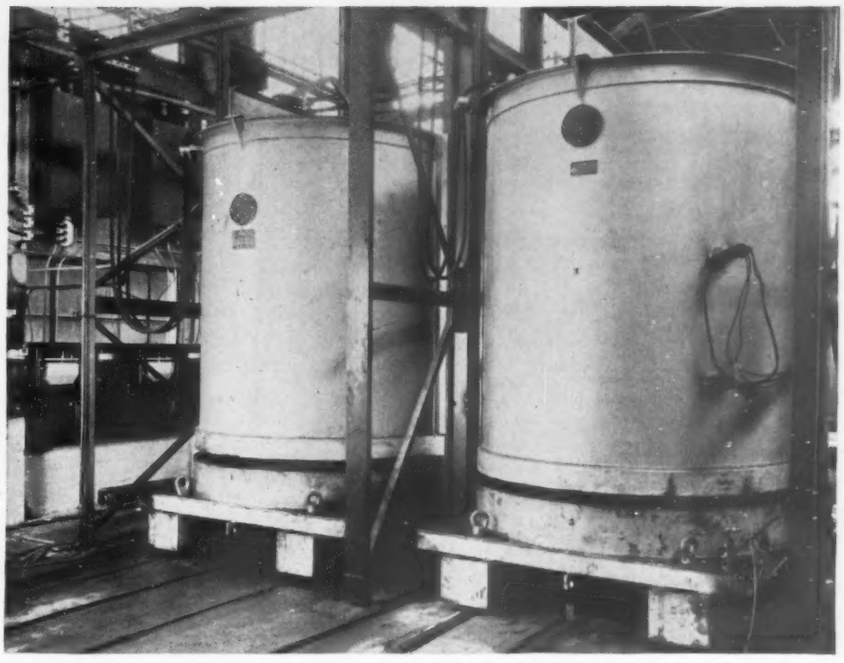
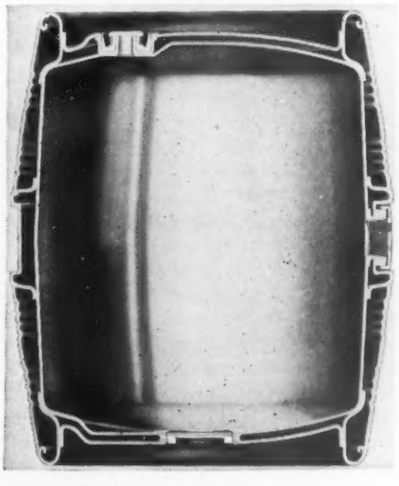


Fig. 4—Here are shown two of the bell-type electric annealing furnaces lowered over their bases and operating. These units are controlld to within plus or minus 10 degrees Fahr. while a gas atmosphere is introduced through the base and surrounds the charge. The annealing cycle has been shortened greatly by use of this equipment

Steel Used in Two New Beer Barrels

NEW designs in beer barrels, with both carbon and stainless steels figuring prominently in the construction, continue to emanate from manufacturers seeking a share of the active market for barrels. At present there are at least a dozen different designs of the all-steel type, the latest of which is the barrel recently introduced by the Firestone Steel Products Co., Akron, O., and shown sectionally in the accompanying illustration.



Inner shell of this new all-steel beer barrel is of stainless steel, obviating the necessity for pitching

This barrel has double walls, outer of heavy-gage carbon steel, inner of chrome-nickel stainless steel, thus requiring no pitching on the interior. Contents are insulated by air space between the walls. The outer shell has several series of parallel corrugations to provide additional strength. The illustration shows the numerous points of support for the inner shell, which increase rigidity and break up the air space into separate cells.

The barrel is of standard bilged shape, designed to fit all types of washing, racking and conveying equipment in breweries. Deep, rounded chimes with no sharp corners facilitate handling, while the rounded inner surface assures good drainage. Bung and tap are of standard variety. Outside surface is furnished in any standard flat color. Full, half and quarter barrel sizes are offered.

Combining wood with steel, the Seattle Cornice Works, 1730 First avenue, Seattle, has announced a new type of barrel in which the interior is of pressed carbon steel, electric-welded and requiring pitching. Chimes are also of pressed steel and are welded to the inner container. Staves and ends of the barrel are of 1¾-inch fir or cedar, tongued and grooved and waterproofed. A layer of asbestos is placed between the wood and steel. The inner container is rustproofed on the exterior with black enamel.

Raising Furnace Roof Effects Greater Transfer of Heat

TO MELT, refine and pour a ton of steel requires 2,900,000 B.t.u. Of this amount of heat, 800,000 B.t.u. must be added to the bath for each ton of metal produced, based on low carbon basic practice and 45 per cent hot metal charge. The foregoing was brought out by W. C. Buell Jr., engineer, Cleveland, who spoke on "Heat Transfer to the Open-Hearth Bath" before the Combustion Engineering division of the Association of Iron and Steel Electrical Engineers during its annual convention in Pittsburgh, Oct. 17-19. Reports of sessions conducted on the first two days of the meeting were presented in the Oct. 23 issue of STEEL.

The most useful index of the comparative production rates of open-hearth furnaces, said Mr. Buell, is found in the term "square feet of hearth necessary to produce 1 ton of steel per hour." Operating and engineering data covering 15 modern installations showed the furnace gas velocity to range from 4.7 to 11.9 feet per second, the time of gas contact with the bath from 3.1 to 7.8 seconds and the transfer coefficient from 18 to 33 B.t.u. per square foot per hour per degree temperature difference. These results were plotted and trend lines established which indicated a longer time of gas contact will produce material fuel economy.

Lower Gas Velocity

Inasmuch as a longer time of contact means a diminished gas velocity, it was shown that if the factor of time is correctly included in the problem, a much greater relative heat transfer will result from the lower velocity, instead of a lesser heat transfer as might be assumed were the rule that increasing the velocity increases the heat transfer rate applied without proper qualifications, Mr. Buell contended.

To maintain present production rate with a lower gas velocity indicates that the chamber over the bath must be enlarged materially, which makes it mandatory that the roof be raised. While it may be difficult to accomplish this in existing plants, Mr. Buell concluded, he considered it worth while because, in addition to fuel economy, roof life will be lengthened materially and charging, particularly of light scrap, expedited.

In commenting on Mr. Buell's statements, J. L. Miller, chief engineer, Carnegie Steel Co., Youngstown, O., emphasized that if the trend points to higher roofs to effect heat transfer, open-hearth roofs can be insulated more easily.

In discussing "Recent Developments in Design and Operation of Industrial Furnaces," G. A. Merkt, engineer, Morgan Construction Co., Worcester, Mass., cited the importance of the "thermal equilibrium" of the furnace as well as the opposing factors which must be balanced for the ideal maximum capacity.

Translating potential heat energy in the fuel into heating capacity is not sufficient, Mr. Merkt pointed out. The speed with which the combustion process proceeds and the ensuing flame temperature were emphasized by the speaker as of vital influence in procuring the desired furnace operations.

A paper on "Heating Slabs for Hot Strip Mills" was presented by W. R. Culbertson, manager, furnace division, Rust Engineering Co., Pittsburgh.

A survey of the available fuels and space for furnace installations is highly important in considering sheet and tin mill pair and pack units according to R. J. Wean, president, Wean Engineering Co., Warren, O. In discussing "Pack and Pair Heating Furnaces in Connection with Sheet and Tin Mills" the speaker emphasized that if there is any question as to the availability of a single fuel on a price basis that would be favorable, it would be advisable to consider equipping the furnace with a dual fuel system for the use of oil and natural gas. This can be done, he stated, with little extra expense and places the producer in the favorable position of being able to shift to the lower cost fuel at any particular time.

A double furnace with a wall between permits proportionate heating, and is found desirable in heating runovers and finishing packs. High heat impulses may be put in one side and not the other. Fuels used by sheet and tin plate producers in this country in the order of choice are raw producer gas, heavy oil, light oil, natural gas and coke oven gas.

Flexibility Often a Factor

In the final analysis, Mr. Wean mentioned two factors of major importance to the producer, namely, the quality of heating and the lowest ultimate cost. Some producers, he mentioned, are confronted with a third problem which is that the equipment must be capable of handling a wide variety of sizes, gages and finishes. It is not unusual for a mill to have scheduled electrical sheets, enameling stock, common black sheets, single pickle and full finished, all going through the same furnace and being rolled on the same mill within 24 hours.

Producers in this position, Mr. Wean stated, cannot roll some of the grades mentioned or are confronted with high scrap losses. The requirement of flexibility, Mr. Wean contended, has removed the heating furnace from the realm of burner and conveyor design to one of utility, and it requires a thorough knowledge of sheet and tin mill practice for the design of such a furnace.

Data covering the operation of bell-type electric furnaces for batch annealing of coiled strip steel were presented by A. N. Otis, industrial engineering department, General Electric Co., Schenectady, N. Y., who spoke on "Electric Furnaces for Annealing Strip and Sheets." He mentioned that it now is possible to obtain from 5 to 15 degrees Fahr. variations in annealing loads of steel varying from 3 to 6 tons. Bright annealing of 0.80 per cent carbon steel is accomplished at a cost of $3.05 per ton using bell-type units compared with $5.75 a ton by former methods.

Uniform temperature is fixed in electric furnaces for annealing strip and under no condition can be altered by the operator. Mr. Otis mentioned ten hours as the annealing time for 6-ton loads which compares with 18 to 24 hours when other methods are

Announces Contest Winners

WINNERS of the contest for the best suggestion of new uses of steel, which the Association of Iron and Steel Electrical Engineers conducted during the past year, were announced at the formal reception which terminated the association's annual convention and iron and steel exposition in Pittsburgh, Oct. 17-19. First prize of $150 was awarded Barton Shover, consulting engineer, Pittsburgh; second prize of $50 to M. Appel, draftsman, Ohio works, Carnegie Steel Co., Youngstown, O.; and third prize of $25 to S. Ein, testing engineer, South works, Illinois Steel Co., Chicago. Judges of the contest included 40 steel mill executives. Details as to the prize-winning suggestions will be given later.

used. The speaker described a walking beam furnace designed for bright normalizing and annealing of auto body or similar sheets which are provided with means to control the cooling rate. Such furnaces, Mr. Otis stated, have been laid out for 120-ton production per day. This type unit, he stated, offers the possibility of eliminating the pickling operation after normalizing, and also for continuous annealing as a substitute for box annealing, thus greatly shortening the process time.

Increase in the use of welding rods with carefully controlled coatings was cited by E. A. Hurme, engineer, Clark Controller Co., Cleveland, who spoke before the Welding engineering division of the association on "Growth of the Electric Arc Welding Industry." Approximately 85 per cent of the electric arc welding done in 1927 was with bare rods, he remarked, whereas in 1932 this type rod constituted considerably less than 25 per cent of the total consumption of electric arc welding rods. The speaker emphasized that the length of the arc is an important factor in governing the quality of the deposit made with the bare mild steel welding rods.

Since it is well known that the surface conditions for materials on welding rods have such a great affect on the welding procedure and the resultant weld, Mr. Hurme stated, it is not surprising to find that most specialized welding rods are surface treated, coated or covered with substances to give some definite benefits. In conclusion, the speaker pointed out that the proportional demand for specialized electrodes, particularly shielded arc types, is increasing tremendously from year to year.

Assembled by Welding

Bennett Chapple, vice president, American Rolling Mill Co., Middletown, O., in speaking on "The Part Welding Will Play in Metal Houses," described the construction of the frameless steel house recently erected in Cleveland. Sheets of 20-gage are used throughout the house for load-bearing walls and floors, these being spot welded in sections suitable for erection on the job. The method of joining is accomplished by the resistant welding process with low voltage and high pressure at the point of contact.

Air cylinders are employed to obtain approximately 1200 pounds pressure at the point of contact. The pressure is on a brief second for each double weld and the current is applied one-third of the time. The speaker mentioned in conclusion that steel houses promise an expanding market for welding process.

In discussing "Welded Steel Products," F. L. Lindemuth, chief engineer, William B. Pollock Co., Youngstown, O., mentioned that the tendency today is to use too much rather than too little weld material. Joints and connections are inconspicuous compared with most other kinds of construction, he stated, and the great strength of welds therefore is not always appreciated. The cost of deposited metal is high, he contended. For hand welding it will run between 50 cents and $2.00 a pound depending on the grade of the work. An excessive amount of welding will run the cost up materially.

Proper stress relieving certainly improves the strength of a good weld, he continued, but it is not always necessary. Miscellaneous photographs of several kinds of work were shown on the screen and the reasons for the many details of construction explained.

Ideas of the part which the steel industry should play in the advancement of the art of welding in the fabrication of mechanical equipment were forcibly presented at the afternoon session by A. E. Gibson, vice president, Wellman Engineering Co., Cleveland. The importance of the part played by engineering staffs in the building of welded steel mill equipment and the need for rigid requirements covering the procedure of welding to insure best results were emphasized by the speaker.

Steel manufacturers should assist the machine designer by producing a number of roll sections, especially adapted to facilitate design and construction asserted Lloyd Jones, rolling mill engineer. To further the development in the use of fabricated shapes, Mr. Jones suggested that a committee be appointed to develop certain roll contours so as to produce sections which can be used in machine design with the least amount of welding, cutting and bending.

Application of rolled steel products to electric locomotive construction and particularly to construction wherein the fabrication is by means of arc welding was presented in a paper on "Rolled Steel Products In Electric Locomotive Construction," by R. V. Devlin, transportation engineering department, General Electric Co., Erie, Pa.

The final paper presented before the welding engineering division was on "Comparison of Welding with Riveting and Bolting for Steel-Building Connections," by G. D. Fish, consulting structural engineer, Westinghouse Electric & Mfg. Co., New York.

Investigates Effect of Iron Oxide in Open-Hearth Slag

CONTINUATION of the three-year program on the study of the physical chemistry of steelmaking—an investigation which has resulted in definite and successful recommendations for the elimination of nonmetallic inclusions in open-hearth steel—was announced in Pittsburgh, Oct. 20, at the conclusion of the seventh open meeting of the metallurgical advisory board to the Carnegie Institute of Technology by F. N. Speller, chairman of the board, and director, department of metallurgy and research, National Tube Co., Pittsburgh. The first open meeting of the board in 1927 attracted 68, but the meeting at Carnegie institute last week took place with 438 open-hearth operators and metallurgists of the steel and allied industries registered. This was a record attendance.

At the opening session, R. F. Mehl, director, metals research laboratory, Carnegie Institute of Technology, in presenting the progress report on research program, announced that a revision of the theory of Widmanstatten figures is being studied. In discussing the thermomagnetic analysis of the binary alloys of iron and manganese, Dr. Mehl stated that the thermal hysteresis is exceptionally marked between 4.4 per cent manganese and 13.1 manganese. The work on iron-manganese alloys is expected to be completed within the near future, he remarked.

Cites Alloy Studies

Other investigations included progress reports on research on plastic deformation and internal strain and the formation of ferrite and cementite from austenite on slow cooling. At the afternoon session, Dr. V. N. Krivobok revealed the progress made on the investigation of corrosion-resisting and heat-resisting alloys. Tests described by the speaker indicate that certain alloys studied are not stable and that under conditions of service at elevated temperature they undergo a rapid and definite change. This change does not constitute the breaking down of austenite, he explained, but concerns primarily the question of solubility. He emphasized the necessity of testing these alloys under lower temperatures. Carbide separation undoubtedly is accompanied by the process of agglomeration and the

speaker predicted that the strength of the alloys gradually will be changed as time goes on and, providing the temperature is sufficiently high, the strength gradually will reach its peak and then diminish.

Five factors are involved in the production of low iron oxide in slags, stated C. H. Herty Jr., in presenting the progress report on "Physical Chemistry of Steelmaking." These he enumerated as prevention of excessive oxidation of the charge during melting, charging of a sufficient quantity of metalloids for almost complete reaction with the iron oxide formed during melting, manipulation of the lime charged so that the slag will not be excessively heavy during the latter stages of the lime boil, use of as much lump ore as possible in the main ore additions, and, the maintenance of the proper percentages of silica and lime in the slag after the main ore addition so that a large increase in oxygen is avoided.

For every grade of steel, Dr. Herty explained, there is a proper iron oxide content of the metal, and therefore, of the slag before deoxidation. He submitted two general methods for arriving at the desired iron oxide content of the slag, namely, the analysis of the slag for iron oxide at various stages of the heat, and the use of some other factor or factors which depend upon or are associated with the iron oxide content of the slag.

Analysis Is Effective

He cited the importance of the analysis of slag for iron oxide during the lime boil, stating that this is the first indication of the state of oxidation of the heat, particularly on high-carbon heats. If the iron oxide is too low at this time, he pointed out, the addition of extra burnt lime is indicated; if the iron oxide is too high then burnt lime which would be added before the ore, may be left out, because high iron oxide at this time generally indicates a low silica content of the finishing slag.

After the main ore addition has worked out and the slag weight is changing rapidly because of the solution of lime, the analysis of iron oxide on high-carbon heats may be misleading. It is better, he contended, to use some other indicator after the ore. On low-carbon heats, he explained, analysis for iron oxide may be used for control with safety because the change in slag weight is much smaller and the percentage change in iron oxide is therefore small. On these heats, the iron oxide in the slag may be raised to the desired point by fine ore or scale following the analysis for iron oxide. If the iron oxide in the slag is too high, which usually is associated with a heat melting soft, the addition of pig iron will lower the iron oxide in the slag by deoxidation of the metal which results in a greater driving force from slag to metal and a consequent decrease in the iron oxide content of the slag.

In discussing indirect methods of control, Dr. Herty mentioned that the fluidity of the slag before the ore is governed primarily by the amount of lime dissolved and the quantity of silica in the slag. He stated that before the lime boil begins the silica in the slag is high and the slag consequently thin, but when the lime starts to go into solution during the lime boil, the slag becomes heavier. During this period, he remarked, the slag is saturated with lumps of lime and the effective area of transfer from slag to metal is reduced. This condition as well as the fact that slags are more fluid at the slag-gas than at the slag-metal surface, he added, causes the iron oxide content of the slag to increase. If the fluidity is high until the ore is added, this indicates that the slags are silicious and extra lime must be added to the charge to increase the basicity. If the slags are heavy during this period, however, they are more basic with a resultant high iron oxide.

Inaugurates New Study

Dr. Herty announced that work has started in the use of synthetic ladle slags which are basic, slightly oxidizing and have a low melting point. This slag, he stated, is thrown on the metal in the ladle before the furnace slag is tapped and preliminary results indicate that a large amount of phosphorus reversion is prevented.

In discussing Dr. Herty's paper, W. J. Reagan, assistant open-hearth superintendent, Edgewater Steel Co., Oakmont, Pa., stressed the importance of taking samples of slag from underneath the top layer of slag and compositing them from three or four doors of the furnace. This, he explained, prevents contamination of the sample with Fe_2O_3 from the top layer of the slag. The speaker directed attention to the fact that in the tables presented by Dr. Herty, samples from the top layer of the slag invariably show a lower iron oxide content and higher Fe_2O_3 than for samples taken below the top layer of the slag. Mr. Reagan mentioned that in his shop the viscosimeter is an invaluable indicator of slag fluidities particularly at any portion of the heat.

The lowest oxygen point is found at about the middle of the lime boil, the oxygen gradually building up as the lime goes into solution to form calcium ferrite, until just previous to the ore addition. This low point in oxygen, Mr. Reagan pointed out, usually can be determined by the use of the viscosimeter, and at this point a fluid slag is found due to the exceptionally high silica and the low lime content.

After the addition of ore, he continued, the iron oxide content of the slag is the amount present previous to ore plus that obtained from the ore, which figures for different types of ore, were presented by Dr. Herty. By maintaining the low point in oxygen at or below the desired figure by controlling the lime and silicon in the charge, he contended, the heat can be finished with the desired iron oxide content by adding sufficient scale or fine ore to the slag to obtain the desired increase.

To prevent the pickup of iron oxide at the end of the lime boil, Mr. Reagan stressed the importance of reducing the lime charge to a minimum, adding whatever lime is necessary to bring the slag up to the desired basicity just previous to the ore addition. The speaker mentioned four heats which were made with only 6160 pounds of calcium oxide in the charge with no apparent attacking of the banks or bottom of the furnace. This, he said, represents about 68.4 pounds of calcium oxide per net ton charge with a charge of about 180,000 pounds. Further evidence of the value of reducing the lime charge to a minimum is found in the time necessary to make the four heats. The average time charge to tap for all four heats was 10 hours and 16 minutes, all cold charge.

Melting Time Not Prolonged

By the use of the iron oxide control method, Mr. Reagan mentioned, no increase in the time to make heats has been noticed. The importance of the effect of slag basicity was stressed by the speaker. He mentioned that with high silica, low lime slags there usually is a loss of oxygen due to a fluid slag. With high lime, low silica slags the converse is true, the heavy slags allowing oxygen to build up in the slag. For a slag with a given excess base, the phosphorus removal is controlled by the percentage of iron oxide in the slag, Mr. Reagan stated. By running a series of two or three phosphorus preliminaries early in the heat, an accurate prediction can be made as to the amount of iron oxide in the slag, a low phosphorus indicating a high iron oxide and a high phosphorus just the opposite.

In discussing the effect of deoxidation on the aging of mild steel, Dr. Herty mentioned that the susceptibility of normalized rimmed steels to quench aging is rather high. In the semikilled steels, he stated, this aging is considerably less than in the rimmed steels. With increasing carbon content, he stated, the susceptibility to this aging follows the same general tendency to diminish. Silicon-killed steels quench age considerably but only about 50 per cent as much as rimmed heats. Aluminum killed steels quench age little, the degree decreasing in proportion to the increased carbon content. Rimmed, semikilled and silicon-killed

steels are susceptible to strain aging even at the higher carbon range, Dr. Herty remarked. Indications are that the degree of oxidation of steel in the furnace, he contended, has considerable bearing on the strain aging of aluminum killed steels.

Carbon alone without oxygen, and oxygen alone without carbon do not result in aging but the combined presence of both does give rise to aging, Samuel Epstein, research metallurgist, Battelle Memorial institute, Columbus, O., stated in commenting on Dr. Herty's report. Apparently the dispersion of cementite in the ferrite is assumed to cause the aging, but the change of solubility of cementite with temperature, which causes the dispersion, is considered to be induced by the presence of oxygen. Thus, he stated, in a thoroughly deoxidized steel, the increase in solubility of cementite in ferrite with rising temperature would not occur.

According to the view given in the report, all that is needed to prevent aging is thorough deoxidation of the steel. It may be, the speaker contended, that the presence of dispersed refractory particles also is essential, particularly for combating local deformations combined with notch effects. He contended that a determination of the relation between grain size and aging might assist in providing a solution to the problem.

In conclusion, Mr. Epstein pointed out that if thorough deoxidation only is needed, the possibility of using a strong deoxidizer, yet one which might give rise to a fusible deoxidation product, for example, calcium silicide, would remain. The presence of refractory particles is necessary, he concluded; however, the sole use of deoxidizers which would have a fluxing action on the deoxidation products would have to be avoided.

Dr. Thomas S. Baker, president, Carnegie Institute of Technology, Pittsburgh, presided at the informal dinner in Hotel Schenley in the evening at which Virgil Jordan, president, National Industrial Conference Board Inc., New York, spoke on "Industrial Progress and Governmental Policy."

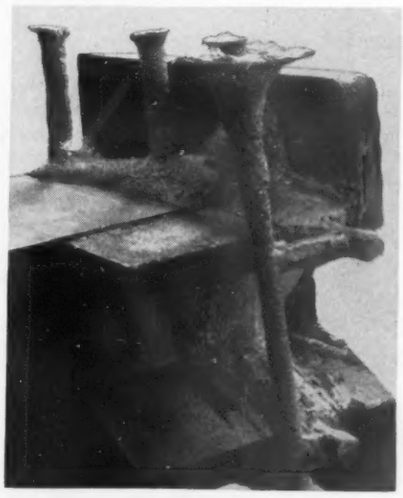
12-Ton Rack for Sponge Ball Press Repaired by Thermit Welding

IRON and steel mill machinery and equipment, in many cases practically idle for two years, suddenly was pushed to maximum capacity during the recent spurt in steel production. As was to be expected, numerous failures occurred. Replacement of parts would have meant costly delays, therefore, in many instances repair by thermit welding was undertaken and found to be a happy, economical solution, again emphasizing the importance of this process in mill maintenance work.

Difficult To Handle

In a wrought iron plant, for example, the 12-ton rack of a large sponge ball press, the largest of its kind, failed. Fracture occurred adjacent to a flange at one end of the rack. Although a difficult job for thermit welding, because of the hollow box section of the rack, the repair was effected speedily and at a small fraction of the cost of a new rack. A close-up of the weld, with risers and pouring gates still in place, is shown in the accompanying illustration.

Six hundred pounds of forging thermit was used, and the entire repair, made by the steel company's own men under supervision of representatives of the Metal & Thermit Corp., New York, required only a few days time including removal of the rack from the press, lining it up on a bed plate, construction of the molds, preheating, and actual making of the weld. The repair can be considered a permanent one because the thermit deposited metal has physical characteristics which are equal in every way to those properties inherent in the parent metal.



Closeup of thermit weld made to effect the repair of the 12-ton rack of a large sponge ball press. Risers and pouring gates are still in place

Stainless-Clad Steel Used In Soap Plant Autoclave

Stainless-clad steel was used in the construction of an autoclave recently installed in the plant of a nationally known soap manufacturer, reported to be the first use of this material for such equipment. The autoclave is 6 feet in diameter by 26 feet in length. Walls are 13/16-inch thick, and the heads 1 inch thick, all of stainless-clad steel, having a 20 per cent thickness of 18-8 chrome-nickel steel on the interior of the vessel. Steel was supplied by the Ingersoll Steel & Disc Co., division of the Borg-Warner Corp., with headquarters in Chicago.

Fabrication was handled by the Hamler Boiler & Tank Co., Chicago. The entire autoclave was built up of butt welded plates. Coated stainless steel welding rod of 25-12 chrome-nickel composition was used for welding the stainless interior of the vessel, and mild steel rod used for the soft steel exterior.

The unit was built under standard A. S. M. E. class 2 specifications for pressure vessels, and approved after undergoing a test at 250 pounds per square inch pressure, which is 67 per cent above actual working pressures.

The use of clad steel in this pressure vessel opens new possibilities for rapidly extending adaptation of the material to the needs of the process industries. Similar autoclaves previously have been constructed of copper or mild steel.

Develops New Die Steel of Cast-To-Shape Type

A new cast-to-shape, oil-hardening die steel, known as K.O.H., has been developed by the Kinite Corp., Milwaukee and Fairmount, W. Va. According to the announcement, this steel is particularly adapted for making cast-to-shape dies for use on shorter production schedules where first costs weigh heavily in the final per piece cost, but where exceptional resistance to wear is an essential property.

In listing the advantages of the new steel, the manufacturer points out that pouring to shape is less expensive and quicker than cutting to shape. The steel can be cast to any shape with very little machining time required, and dies made from it are quickly made ready to be placed into production.

K.O.H. steel is a companion to Kinite, a cast-to-shape steel alloy, which, because of its long-wearing qualities, is used extensively in tools and dies on unlimited production schedules.

The Plastic Forming Of Metals

BY PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part I—Laws and Fundamentals of Plastic Forming

2. Condition of Constant Volume and Displacement of Material

THE volume of a metallic substance remains practically unchanged during plastic forming. Appreciable changes in volume are encountered only in the rolling and forging of cast ingots, and arise in this case from the fact that the cavities produced in the casting by blowholes and pipes are closed, and the body is correspondingly condensed, during the first part of the deformation. However, subsequent forming has no appreciable influence upon the density of the body. In particular, the reduction of the specific weight during cold forming, and the elastic deformations as well, are so small as to be practically negligible in comparison to the very great plastic deformations which occur in the technical forming processes.

Although the acceptance of the constant volume condition signifies a simplification, in comparison to the laws which apply in the elastic region, the change of the basic dimensions of the body during the forming process, on the other hand, must be considered in the case of plastic forming. In order to determine the laws of deformation which apply to these circumstances, a rectangular body is considered of height h_0, length l_0, and width b_0, which is transformed, by a deformation perpendicular to the bounding surfaces (parallelopipedal deformation), into a rectangular parallelopiped of dimensions h_1, l_1, and b_1 (Fig. 3). Between the initial and the final dimensions, according to the condition of constant volume, the following relation must hold:

$$h_0 \times l_0 \times b_0 = h \times l \times b = h_1 \times l_1 \times b_1 = V \quad \ldots\ldots (2)$$

or

$$\frac{h_1}{h_0} \times \frac{l_1}{l_0} \times \frac{b_1}{b_0} = \gamma \times \lambda \times \beta = 1 \quad \ldots\ldots (3).$$

The quotients

$$\frac{h_1}{h_0} = \gamma, \quad \frac{l_1}{l_0} = \lambda, \quad \frac{b_1}{b_0} = \beta$$

can be designated as the relative compression, elongation, and spreading, respectively. Taking the logarithm of each side of equation (3), the expression for the condition of constant volume becomes:

$$\log_e \gamma + \log_e \lambda + \log_e \beta = 0 \quad \ldots\ldots (4).$$

The quantities

$$\log_e \frac{h_1}{h_0} = \log_e \gamma, \log_e \frac{l_1}{l_0} = \log_e \lambda, \log_e \frac{b_1}{b_0} = \log_e \beta,$$

are defined respectively as the compression, elongation, and spreading. The sum of the three principal deformations, the compression, elongation, and spreading, is accordingly equal to zero. The principal deformations can also be expressed in the integral relation:

$$\log_e \gamma = \int_{h_0}^{h_1} \frac{dh}{h}, \log_e \lambda = \int_{l_0}^{l_1} \frac{dl}{l}, \log_e \beta = \int_{b_0}^{b_1} \frac{db}{b}.$$

In the logarithmic representation, the deformations accordingly correspond to the integrations of all infinitely small principal deformations, which are referred to the momentary length[20]. For very small deformations, the equation becomes:

$$\frac{\Delta h}{h} + \frac{\Delta l}{l} + \frac{\Delta b}{b} = 0 \quad \ldots\ldots (4a).$$

From equation (4), it follows that only two of the three principal deformations can have the same sign, and that in such a case the third principal deformation has the opposite sign, and represents in absolute magnitude the sum of the first two principal deformations. This deformation will hereafter be designated as ϕ_h, and the other two deformations as ϕ_n, from which the equation becomes:

$$\phi_h = -\Sigma \phi_n \quad \ldots\ldots (5).$$

If the flow of material is equal in all directions, as it is in the compression of a cylinder, for instance, the deformation in a plane perpendicular to the axis of the cylinder is:

$$\phi_{n_1} = \phi_{n_2} = -\tfrac{1}{2}\, \phi_h.$$

In the plane flow of material, in general, no deformation occurs in one direction. In the other two directions of principal deformation, the deformations are equally great but opposite in sign.

If the principal directions (axes) of the rectangular parallelopiped considered do not coincide with the principal deformation directions, the rectangular parallelopiped is distorted by additional displacement into a parallelopiped having oblique angles. A statement can be made regarding the deformations which are produced in this way, if one imagines a sphere, inscribed in the cubical initial body, which is transformed during the deformation into an ellipsoid, and which remains inscribed, even after the deformation, in the resulting parallelopiped (Fig. 4). Use of the constant volume condition provides the equation:

$$\pi \times r_0^3 = \pi \times r_1 \times r_2 \times r_3 \quad \ldots\ldots (6),$$

in which r_0 represents the radius of the initial sphere, and r_1, r_2 r_3 represents respectively the three principal radii of the ellipsoid of deformation. The principal deformation directions are now determined by the position of the principal axes of the ellipsoid of deformation. The principal de-

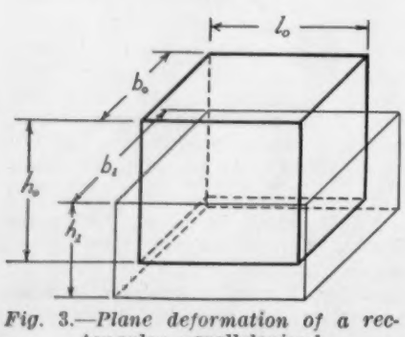


Fig. 3.—Plane deformation of a rectangular parallelopiped

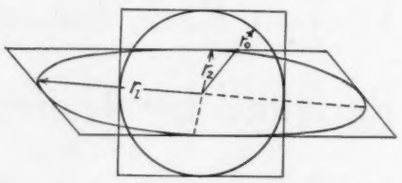


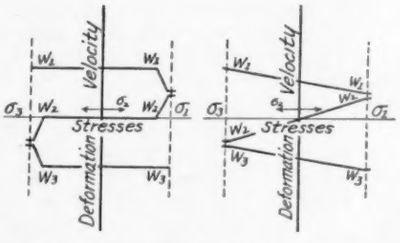
Fig. 4.—Ellipsoid of deformation

[20] P. Ludwik: Elemente der technologischen Mechanik; J. Springer, Berlin, 1909.

formations are calculated from the radii of the ellipsoid as:

$$\phi_1 = \log_e \frac{r_1}{r_0},\ \phi_2 = \log_e \frac{r_2}{r_0},\ \phi_3 = \log_e \frac{r_3}{r_0} \quad \ldots\ldots (7).$$

If the position of the principal deformation directions with respect to the rectangular parallelopiped does not remain constant during the deformation, it then becomes necessary to follow all the intermediate stages of the deformation, in order to obtain an accurate insight into the course of deformation. In continuous forming processes, it is possible to follow all the successive stages experimentally, by dividing the body to be investigated through a plane of symmetry, and by determining the changes in a system of rectangular coordinates which has been scratched on the dividing surface. The two opposite limiting surfaces of the body element in question are in this case normal to a principal stress direction, so that displacements are possible only in a plane which is parallel to the plane of symmetry, and the investigation is thereby essentially simplified. The details of this method are described



Influence of the intermediate principal stress upon the course of deformation; Fig. 5 (Left) according to the shear stress theory; Fig. 6 (Right) according to equation (10)

in Part III, together with the investigations on the course of deformation in the technical forming processes.

If a deformation ϕ is produced in time t, the average velocity of deformation in the direction considered is $w_m = \frac{\phi}{t}$. In an infinitely short period of time dt, the deformation velocity is represented by $w = \frac{d\phi}{dt}$. Because $d\phi$ can be replaced by $\frac{dh}{h}$, as in compression, for instance, the expression for the deformation velocity in the direction of compression can be transformed into:

$$w = \frac{d\phi}{dt} = \frac{dh/h}{dt} = \frac{dh/dt}{h} = \frac{v}{h} \quad \ldots\ldots (8);$$

in which v indicates the velocity of

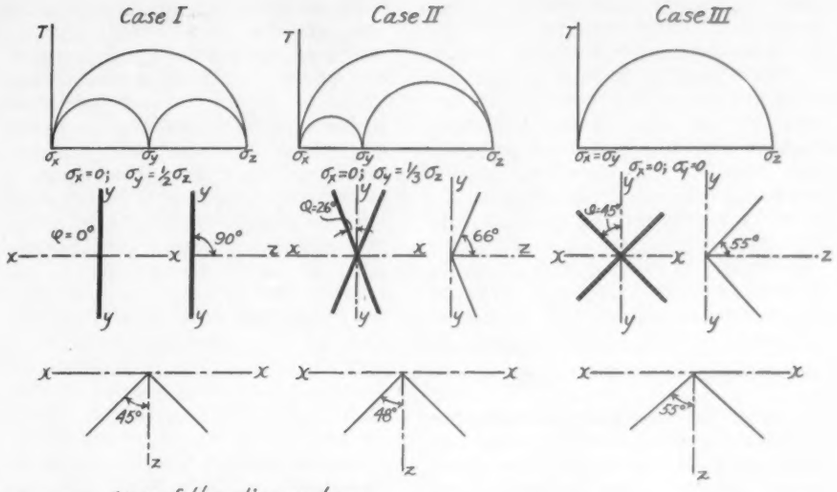


Fig. 7—Influence of the stress distribution upon the position of the slip line system

compression, and h the dimension of the body in the direction of compression. According to the condition of constant volume, the velocity of deformation in the three principal directions of deformation must fulfill the condition:

$$\frac{d\phi_1}{dt} + \frac{d\phi_2}{dt} + \frac{d\phi_3}{dt} = w_1 + w_2 + w_3 = 0 \quad (9).$$

The manner in which the deformations are affected by the condition of stress under which they are produced will now be investigated. If the shear stress theory were exactly valid, displacements could occur only in the direction of the maximum shear stress. The maximum shear stress, however, occurs in planes which are inclined at 45 degrees from the maximum and minimum principal stresses, and is always normal to the intermediate principal stress. In the direction of the intermediate principal stress, therefore, no flow of material whatever would occur unless this direction were to coincide with that of one of the outer principal stresses. In the latter case, two principal stress directions become equivalent with respect to the flow of material, so that an equal flow of material in all directions can occur in a plane normal to the third principal stress direction. The deformation relations with varying position of the intermediate principal stress would then exist as shown in Fig. 5. If the intermediate principal stress σ_2 coincides, the deformation velocities w_1 and w_3 are half as great as w_3 and are opposite to the latter in sign. In any desired intermediate position of σ_2 between the two outer principal stresses σ_1 and σ_3, plane flow of material prevails; and w_1 is equal to w_3 but of opposite sign, while no deformation occurs in the direction of the intermediate principal stress ($w_2 = 0$).

Finally, if σ_2 is equal to σ_3, the deformation velocity in these two directions will be equal to one-half the value of w_1, and will be opposite to the latter in sign. Naturally, the deformations are given the positive sign in the direction of the greatest of the three principal stresses, and the negative sign in the direction of the smallest principal stress, if the sequence of stresses is listed from $+\infty$ (tension) to $-\infty$ (compression).

The tests by W. Lode[19] and by M. Ros and A. Eichinger[18], on the influence of the intermediate principal stress upon the flow of metals, have now shown that the laws of material flow which are to be expected according to the shear stress theory are not strictly valid. In particular, plane flow of material with $w_2 = 0$ does not prevail always, independent of the position which the intermediate principal stress takes with respect to the two outer principal stresses; but w_2 is changed continuously, if the intermediate principal stress is displaced from σ_1 to σ_3, from $-\frac{w_3}{2}$ to $-\frac{w_1}{2}$, and passes through the value o only for $\sigma_2 = \frac{1}{2}(\sigma_1 + \sigma_3)$. This relation between the deformations and the stresses is indicated by the equations:

$$\left.\begin{aligned} w_1 &= \delta[\sigma_1 - \tfrac{1}{2}(\sigma_2 + \sigma_3)] \\ w_2 &= \delta[\sigma_2 - \tfrac{1}{2}(\sigma_3 + \sigma_1)] \\ w_3 &= \delta[\sigma_3 - \tfrac{1}{2}(\sigma_1 + \sigma_2)] \end{aligned}\right\} \quad \ldots\ldots (10);$$

in which the value of δ depends

[18] M. Ros and A. Eichinger: Versuche zur Klarung der Bruchgefahr, Eidg. Mat. Pr. Anst. a. d. Eidgen. Technischen Hochschule Zurich 1926.

[19] W. Lode: Versuch uber den Einfluss der mittleren Hauptspannung auf das Fliessen der Metalle; Z. angew. Math u. Mech., 5 (1926)) p. 142.

upon the material and upon the test conditions. This relation leads to the graphical representation which is shown in Fiig. 6. In this case the deformations in the direction of the greatest of the three principal stresses are designated as positive, and those in the direction of the smallest principal stress as negative. In the direction of the intermediate principal stress, positive deformations occur as long as this stress is greater than $\frac{1}{2}$ $(\sigma_1 + \sigma_3)$, whereas the deformations in this direction are negative in the opposite case.

Entire Structure Participates

The extent to which the behavior of metals in plastic forming deviates from that indicated by the shear stress theory is easily understood when the polycrystalline nature of the material is considered. The entire structure of a body must participate in the deformation, because of the cohesion of the crystals along the grain boundaries. Because the sliding mechanism of individual grains is stipulated crystallographically, sliding in many grains must occur in directions which do not coincide with the direction of the principal shear stress, but in which the shear stresses differ only slightly from the maximum shear stress. Deformations also occur in the direction of the intermediate principal stress. The prerequisites to deformation in this direction exist to a greater extent, the more the intermediate principal stress approaches one of the two outer principal stresses. Even when the intermediate principal stress becomes equal to $\frac{1}{2}$ $(\sigma_1 + \sigma_3)$, local deformations in the same direction may be expected, which in this case, however, must be cancelled in their effect.

The described flow of material can also be explained clearly by means of displacements along two identical, mutually inclined systems of slip planes, the mutual inclination of which changes according to the position of the intermediate principal stress[21] (Fig. 7). The previously described statistical method of treatment, however, probably comes closest to the actual relations, and probably suffices also to explain the deviations of the stress relations from those which are required according to the shear stress theory.

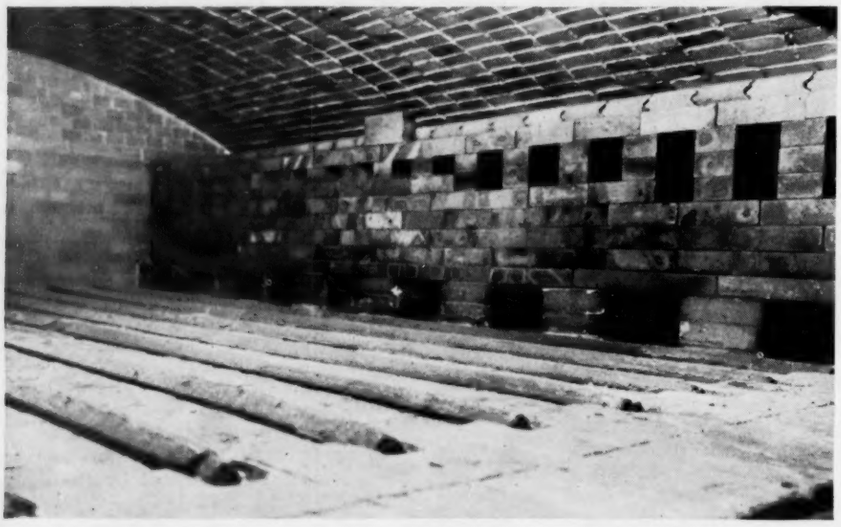
The fact should be considered that the foregoing relations are valid only for semi-isotropic metallic bodies. The mechanism of deformation in single crystals is determined wholly by the position of the crystallographic slip planes. Similar relations probably exist in polycrystalline metallic bodies after a severe cold deformation, although here, as is shown by the X-ray tests of H. Mark, M. Polyani, E. Schmid[22], F. Wever[23], and others, the semi-isotropic condition no longer exists. Instead, various sorts of deformation textures are formed, in which the crystals are twisted until certain crystallographic directions coincide with the principal deformation directions. The crystalline construction of the metal considered, as well as the forming process which is employed, has an influence upon the resulting texture. Undoubtedly there is a close relation between the orientation of the ellipsoids of deformation in the various zones of the deformed body, and the described crystal orientations which can be determined by X-ray tests.

(To be Continued)

[21] F. Korber and E. Siebel: Zur Theorie der Reisswinkelbildung; Mitt. K. W. Inst. Eisenforsch., 10 (1928) p. 198.

[22] H. Mark, M. Polanyi and E. Schmid: Vorgange bei der Dehnung von Zinkkristallen; Z. Phys. 12 (1922) p. 58.

[23] F. Wever: Uber die Walzstruktur kritisch kristallisierender Metalle; Mitt. K. W. Inst. Eisenforsch. 5 (1924) p. 68; —F. Wever and W. Schmidt: Beitrage zur Kenntnis der Struktur kaltgewalzter Metalle; Mitt. K. W. Inst. Eisenforsch. 9 (1927) p. 263;—F. Wever and E. Schmid; Beitrage zur Textur kaltverformter Metalle; Mitt. K. W. Inst. Eisenforsch. 11 (1929) p. 109.



OIL FURNACE HEATS STAINLESS BILLETS: Built and installed by the Electric Furnace Co., Salem, O., in the plant of the Ingersoll Steel & Disc Co., Newcastle, Ind., this oil-fired hearth-type furnace is used for heating billets and reheating sheets of high-carbon, alloy and stainless steel. Furnace is heated by means of oil burners in front firing into a "carboradiant" refractory chamber on each side of the hearth. Products of combustion are forced from the chambers by a blower, around the charge and to the stack. The view above shows one of the firing chambers. Ready control over the furnace atmosphere is said to be obtainable, and the oil is completely gasified in the combustion chamber. Production is 7200 pounds of steel per hour, reheated from 1400 to 1900 degrees Fahr., with oil consumption estimated at 14 gallons per ton. Refractory material was supplied by the Carborundum Co., Perth Amboy, N. J.

Ball Bearing Installation Is Made More Simple

A new type of ball bearing design featuring a flange cartridge unit instead of the conventional pillow block has greatly simplified the application of bearings. A good example of an installation of the new type is to be found on a conveyor in the plant of the Goodrich Rubber Co., Akron, O.

The company desired to equip this conveyor with ball bearings and it was confronted with the problem of making the installation most economically and efficiently. The flange cartridge unit developed by the Fafnir Bearing Co., New Britain, Conn., permitted the conveyor roll shaft to be given a ball bearing mounting by merely extending the shaft through the steel channel web and bolting the cartridge unit in place.

Had pillow blocks been used, it would have been necessary in some places to build up shelf angles on which to mount the blocks, thus adding to the structural steel work and, of course, the assembly time. In this particular installation, the cartridge unit provided added rigidity, due to the fact that the web was sturdier than the channel flange on which the pillow blocks would have had to be mounted.

Zinc in relation to general and industrial hygeine is the topic of a report by Drs. C. K. Drinker and L. T. Fairhall, published in the Aug. 11 issue of *Public Health Reports* issued by the United States public health service. Problems arising from the ingestion and inhalation of zinc and zinc compounds are surveyed.

Making the Most of

METHODS AND MATERIALS

THE proper time to safeguard a die is at the time it is being designed; often the difficulty experienced in designing safe dies lies in not giving due consideration to all possible means of producing a part. It is the tendency in many design departments, when tools are to be laid out for limited production of parts requiring several operations, to design several simple tools, each to do one operation. Some of these operations are safe and others are not, thereby requiring special safeguarding. If the work could have been laid out progressively, the whole job would have been inherently safe as the stock could be fed from the strip, making it unnecessary to put the operator's hands in danger at any time. At the same time, the die cost in most cases would be no greater and in many cases less than for three single operation dies. The pieces could be produced more economically on progressive dies than on single dies and only one die set-up instead of three would be required. This saves the cost of two set-ups, releases two presses for other jobs and cuts down cost of production.

$ $ $

A battery of 12 automatic machines which shape and cut lock washers was supplied with tungsten carbide guides at a saving of $397 in three months. The washers are of cold-drawn steel with Rockwell C hardness of about 90.

$ $ $

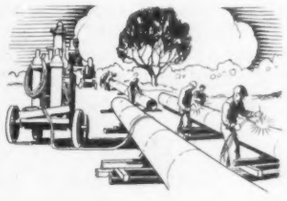
HEATING of electrolytically-deposited chromium coatings to a high temperature to induce their diffusion into the metal has not proved successful in practice, for before the required temperature is reached the coating begins to peel. Even high heat-resisting coatings cannot withstand temperatures above 800 degrees Fahr. at which point no diffusion takes place. Porosity and the peeling of deposited coatings thus are not eliminated by modern electrolytic methods. According to a new patent taken out in Europe, adhesion of chromium coatings may be improved considerably by using an intermediate deposit of nickel or cobalt between the chromium and base metal, and subsequently heating the coated product in a neutral atmosphere at a temperature at which the intermediate layer does not melt, but the coatings are given an opportunity for reciprocal diffusion.

$ $ $

Monel metal is welded readily by all the methods commonly used for steel, including oxyacetylene, metallic and carbon arc, flash, butt, spot and seam; however, it is important that the proper welding rod, flux and methods be used.

$ $ $

A vitreous enamel recently has been offered for pipeline protection. The material seems to have possibilities, but only exposure to a variety of soil conditions will tell definitely the extent of the protection such a coating can afford. In addition to withstanding soil action, the coating must resist considerable rough handling and be reasonable in cost.



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The flange on a chilled cast-iron wheel on a locomotive crane used on a big lumber project in the Northwest broke off for a distance of about 16 inches. As all the wheels on the crane were geared together it would have been necessary to replace one wheel to remove all the wheels and replace them with new ones. This made it important that the broken wheel be repaired if possible and bronze welding was suggested. The operation was entirely successful and when inspected after the wheel had been in service over two months, only the color of the repair indicated where the bronze was. Because of the success of this work, other plants heard of the job and in the course of the next few months many chilled cast iron wheels were put back in service.

$ $ $

A 3-ton nickel cast-iron lead melting pot still is in service after 11 months; plain cast iron pots failed in approximately 6 months. The nickel pot was of the following analysis: Total carbon, 3.20; silicon, 1.25; nickel, 2.50; and chromium, 0.50 per cent.

$ $ $

A PLANT carburizing screw stock in a rotary furnace found that threads would not stand continuous tumbling. A time-cycle contactor, geared for one revolution in 10 minutes, was installed. This device energizes the motor drive of the furnace for a half turn of the work chamber once in each cycle, thereby permitting the work to be re-aligned and the gases to penetrate the surfaces uniformly. In this way breaking and warping of the threads has been eliminated entirely.

$ $ $

Paint gun manufacturers have adopted a nitriding type of steel for nozzles. A nozzle wears out rapidly by virtue of the friction produced as the paint is forced out under high pressure and at high speed.

$ $ $

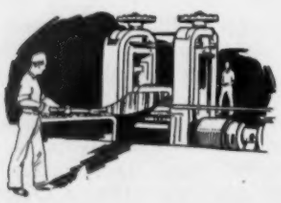
Chromium plating of gages offers advantages other than long wear. In some instances it contributes considerably toward reducing the first cost of the tool. To illustrate, an electric refrigerator manufacturer uses an alignment bar to test squareness of the crankshaft hole with the cylinder bore. This bar is 1.0000 inch diameter and 20 inches long, held to a maximum limit for roundness, straightness, and size of 0.0001 inch. Gage makers will recognize this job as difficult, the hardest part being to grind round within the specified limit. By plating these bars, it is possible to use a tough inert steel of low hardness, 50-55 Rockwell, which eliminates most of the tendency for the bar to spring while being ground. Grinding and lapping on this job is performed much easier with the body of the bar in this condition.

PROGRESS IN STEELMAKING

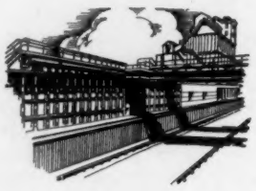
TWO timing relays and a network of resistors, which permit the use of a radio-type rheostat for adjusting the time element, automatically operate the water sprays serving a 4-high hot strip mill in the Great Lakes district. By this arrangement three spray operators have been released for other duties in the mill. In operation, a heated slab contacts a limit switch thus causing the first timing relay to become energized. After a definite time, which can be adjusted to suit rolling conditions, the hydraulic valve is opened and the ejected spray water under 1000 pounds per square inch pressure strikes the heated slab just back of the forward end, thus avoiding any cooling action at the end itself. When the trailing end releases the limit switch the second timing relay is actuated and the spray at the next pass plays on the steel and stops just before the rear end passes beneath. A time adjustment is provided for opening and closing the spray valves to conform to rolling schedules.

♦ ♦ ♦

Depth of undercut of stopper bolts for steelworks ladles should be 55 to 60 per cent of the stopper diameter, to obtain the best pouring practice, according to an authority.



OPERATING costs of hot sheet and tin mills are greatly reduced by the use of the latest types of hot neck greases and modern methods of applications, according to an authority on mill lubrication. Efficient lubrication of the roll necks curtails wasted power and affords a saving of 15 to 20 cents a ton at sheet mills and from 20 to 25 cents a ton at tin mills.



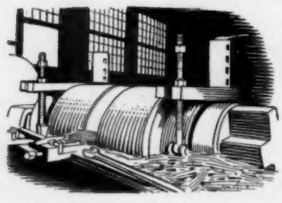
RECENT tests made at a by-product plant in the Pittsburgh district disclose that the use of washed coal for coking purposes affords a reduction in the ash and sulphur content, a 10 to 15 per cent improvement in the physical qualities of the coke, an increase in the porosity of the coke, a higher yield of by-products, increased coal production at the mines and improved blast furnace operation.

♦ ♦ ♦

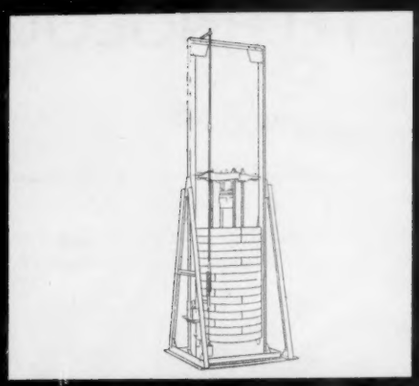
Abrasive cleaning of 4 x 2-inch billets, 30 feet long, at a plant in the Great Lakes district, has effected a reduction in the costs compared with pickling. The equipment employs centrifugal, tangential and air-dynamic forces rather than compressed air in impinging the abrasive against the work being cleaned. The machine consists essentially of a revolving wheel which throws an abrasive from vane outlets at its circumference against the billets which move beneath through an enclosed chamber. Introducing the abrasive below the center of the wheel causes the bulk of it to be thrown downward upon the steel when ejected rather than upward. The abrasive collects at the bottom of the chamber and is returned to an elevator hopper by a continuous bucket elevator. The billets are fed into the machine on motor-driven rolls at a speed of about 60 feet a minute. The capacity of the unit varies, but in this instance more than 200 tons of steel has been cleaned in 10 hours. In cleaning the billets No. 38 grit, crushed cast shot is found to be most suitable. Less than 4 pounds of the abrasive shot is consumed per ton of billets cleaned. One man is employed to operate the machine and two to handle the billets before and after the cleaning process. This method of cleaning billets is claimed to facilitate the subsequent chipping process, as well as increase its speed by making surface defects more discernible.

♦ ♦ ♦

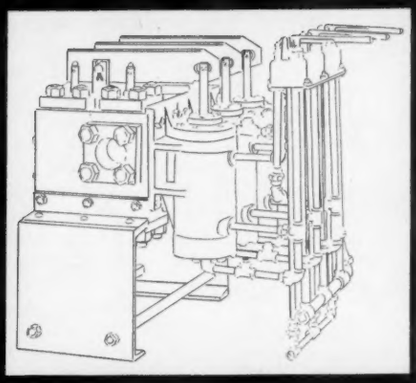
Blast furnace operation is greatly improved by the use of coke made from washed coal, based on the same average operating conditions at five stacks which changed from coke made from raw coal to that made from washed coal. Smelting with this grade of coke has effected a 5 to 8 per cent reduction in the coke consumption; a 5 to 10 per cent reduction in the flux, with a subsequent reduction of 7 to 12 per cent in the slag volume; a 5 to 8 per cent reduction in blast pressure, resulting in a substantial decrement in the power requirements; and, a 5 to 8 per cent increase in the production of pig iron with low sulphur.



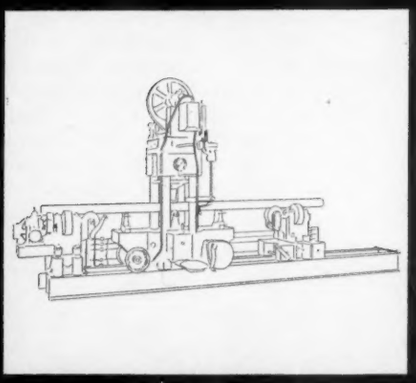
SULPHURIZED mineral oil is finding wide application as a cutting fluid in turning steel mill rolls. Not only is less power required in removing the metal at a given rate, but the finish is improved and the tool life extended.



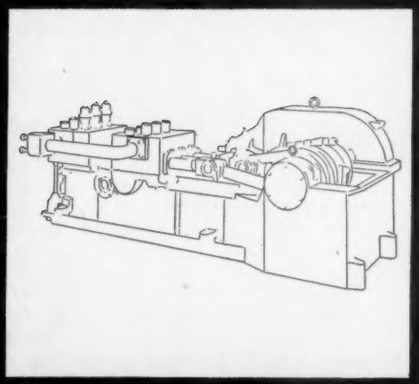
ACCUMULATOR



VALVE



STRAIGHTENER



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SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Ball Bearings

By Charles O. Herb, in Machinery, September, p. 1, 5 pp., 5 ills.

Manufacture of precision ball bearings calls for certain precautions to safeguard accuracy and quality. Rust and dirt are the worst enemies of ball bearings, not only in use, but during manufacture. To reduce chances of corrosion, the various parts are sent through the manufacturing operations in as rapid sequence as possible and a thin film of oil is kept on all parts. To provide this oil film and to eliminate dirt, the parts are run through automatic washing machines between the different manufacturing operations, before and after assembly, and also after the final inspection has been completed. Atmosphere in the assembly room is filtered to remove dirt particles.

—STEEL, 10-30-33

Scaling of Steel

By Clair Upthegrove, in engineering research bulletin No. 25, University of Michigan, Ann Arbor, Mich.; August, 36 pp., illustrated; price 50 cents.

This bulletin presents the results of an investigation of the scaling of steel, sponsored by the American Gas association at the University of Michigan. Studies were made of two phases of the general problem of scaling. In the first part, individual factors which affect scaling were investigated. These are: Temperature, time of exposure to scaling medium, rate of flow of scaling agent, partial pressure of the scaling agent and the nature of the scaling agent itself. Determinations were made for each of the four simple scaling agents—dry air, oxygen, carbon dioxide and water vapor. In the second phase, results of the first part were carried over to the complex type of atmosphere.

—STEEL, 10-30-33

Protection of Workers

Pamphlet issued by policyholders service bureau of Metropolitan Life Insurance Co., New York, 15 pp., 5 pp., 4 ills., bibliography.

Because of the increasing number and diversity of uses of chromium and its compounds, efforts have been renewed toward methods of protection of exposed workers. This pamphlet is a study of causes, effects and preventive measures; a scientific analysis of the problem but phrased in language readily understandable by nontechnical men, such as superintendents, foremen and others.

—STEEL, 10-30-33

Corrosion

Reprint authorized by American Society for Testing Materials, 1315 Spruce street, Philadelphia; 36 pp., charts and tables; price 50 cents.

Annual report of A. S. T. M. committee A-5 on corrosion of iron and steel, including detailed records of the extensive tests sponsored by the committee, and results of various inspections of test specimens made during the past year. Subcommittee reports also are presented.

—STEEL, 10-30-33

Washing Coal

By H. W. Seyler, in Coal Age, June, 8 pp., 6 ills., 8 tables, 7 charts.

Description of coal-washing methods at the Clairton by-product coke works of Carnegie Steel Co., Clairton, Pa. A number of advantages result from washing of coal at this plant, such as: Reduction of ash and sulphur in coke; improvement in physical qualities of coke; decreased yields of small-size coke; reduction of hydrogen sulphide content of coke-oven gas; increased yields of by-products, and others.

—STEEL, 10-30-33

Tube Manufacture

By J. Linell Cook, in The Australasian Engineer (Australia), Sept. 7, p. 12, 3 pp., 1 ill.

Discussion of the manufacture of all types of iron and steel tubular products, including buttweld, lapweld and seamless processes. In the latter classification, attention is given to the Mannesmann, Pilger and Wellman methods of making seamless tubes.

—STEEL, 10-30-33

Cutting Materials

By J. M. Highducheck, in Machinery, September, p. 12, 6 pp., 3 ills, 4 tables, 1 chart.

Discussion of modern metalcutting materials and how to select them, presenting results of extensive tests at the East Pittsburgh, Pa., plant of Westinghouse Electric & Mfg. Co. Cutting tool materials adopted as standard as the result of these tests include: Tungsten high-speed steel; low-cobalt high-speed steel; high-cobalt high-speed steel; stellite No. 3; stellite J-metal; tungsten carbide; and tantalum carbide.

—STEEL, 10-30-33

Blast Furnace Control

By Oliver P. VanSteewen, in Blast Furnace & Steel Plant, October, p. 523, 4 pp., 4 ills., 1 table.

First of a series of articles describing centralized measuring and controlling equipment installed on the Essen-Bergehorbeck blast furnace plant of the Fried. Krupp A. G., Germany. Control equipment was supplied by Siemens & Halske A. G., Berlin. Full control and regulation of the air blast as well as composition, distribution and temperature of gases at all vital points in the system is provided.

—STEEL, 10-30-33

Fire Tests

By Nolan D. Mitchell, in research paper RP563 of the bureau of standards, 22 pp., 7 ills., 3 tables, 7 charts.

Report of fire tests of six steel building columns protected with gypsum, made to supplement previous fire tests of columns similarly protected. The tests demonstrate the importance of some form of positive bond, such as steel cramps or ties, to hold unplastered block coverings in place.

—STEEL, 10-30-33

Small Castings

By Ralph Burke, in The Foundry, October, p. 22, 4 pp.; first of two articles.

Basic principles involved in the production of small steel castings. Strength and reasonably smooth finish are essentials, the latter being obtained by careful attention to molding sand. The article outlines requirements for a good molding sand.

—STEEL, 10-30-33

Creep Study

By W. A. Tucker and S. E. Sinclair, research paper RP572 of the bureau of standards, 15 pp., 4 ills., 2 tables, 15 charts.

Presenting results of a study of the creep characteristics at 1600 degrees Fahr. of 15 alloys covering a range from 1 to 75 per cent nickel and from 3 to 55 per cent chromium. Results are compared with those of a previous investigation at 1000 degrees Fahr. on similar alloys.

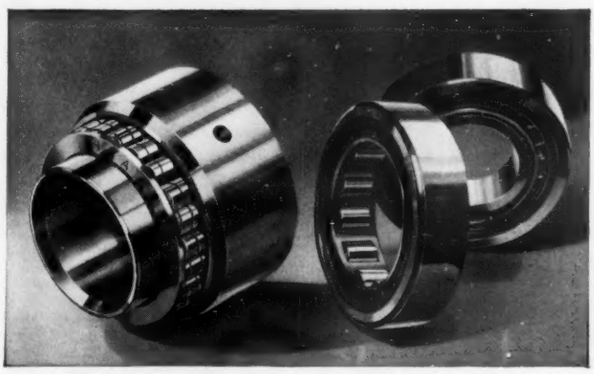
—STEEL, 10-30-33

WE SPENT THOSE LEAN YEARS

... *advancing manufacturing methods*

That was a great depression, wasn't it? It depressed some more than others. Many made good use of it—and Hyatt is numbered among the latter.

During those lean years our equipment and production engineers were constantly visiting plants of modern machine builders and machine users. Their job was to find better methods and newer machines—to increase precision, promote accuracy and protect Hyatt quality.



As a result, equipment good only a few years ago was obsoleted to make room for new machines, which we have helped to create for our particular uses. We spent millions during the depression to enhance Hyatt quality and performance—to take care of your bearing requirements. Hyatt Roller Bearing Company, Newark, Detroit, Chicago, Pittsburgh, Oakland.

HYATT

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

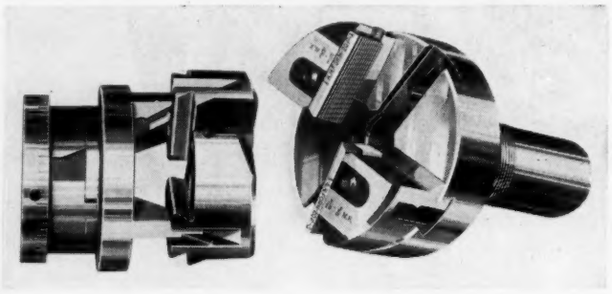
Threading Die Heads Have Outstanding Features

Landis Machine Co. Inc., Waynesboro, Pa., recently developed a new series of threading die heads designed to supplement, but not supersede, its present line of heads. The units are built in the following types and sizes: 1¼-inch Landex heads designated type L, for automatic screw machines; ⅝-inch, ⅞-inch and 1¼-inch Landmatic heads, type H, for turret lathes; ⅝ and ⅞-inch Lanco heads, type V, for hand operated threading machines. The three units are shown across the bottom of the page in the order given above.

These die heads are made of a special alloy steel and are hardened and precision ground throughout. Simple in design, their construction is such as to provide remarkable rigidity, thus insuring accuracy and at the same time virtually eliminating wear of the working parts. The heads are recommended for high production or heavy-duty service, or for work that must be held to extremely close thread limits. In design, they represent a radical departure from the conventional Landis design. The chasers used in the type V, L or H heads are, however, the same as those employed in the Lanco, Landex or Landmatic heads now in use and are interchangeable with these heads.

Chaser holders in which the chasers are supported, are mounted on the face of the head body. These chaser holders operate in dovetail slots ground in the head body and have an unusually wide bearing surface consisting of the combined areas of the base and the dovetail section of the chaser holders. Driving member of the die heads, that is, the shank or attaching flange, is attached directly to the head body in which the chaser holders are supported.

Head opening action is obtained by moving the chaser holders in which the chasers are mounted, away from the work. As shown in the dismantled view herewith, the position of the chaser holders is controlled by the prongs which are an integral part of the closing ring. The supporting surfaces of these prongs act as cams and, as a key in the chaser holder slot fits into a keyway in the prong, the action of the chaser holder, both to and from the "closed" or "locked" position, is positively controlled.

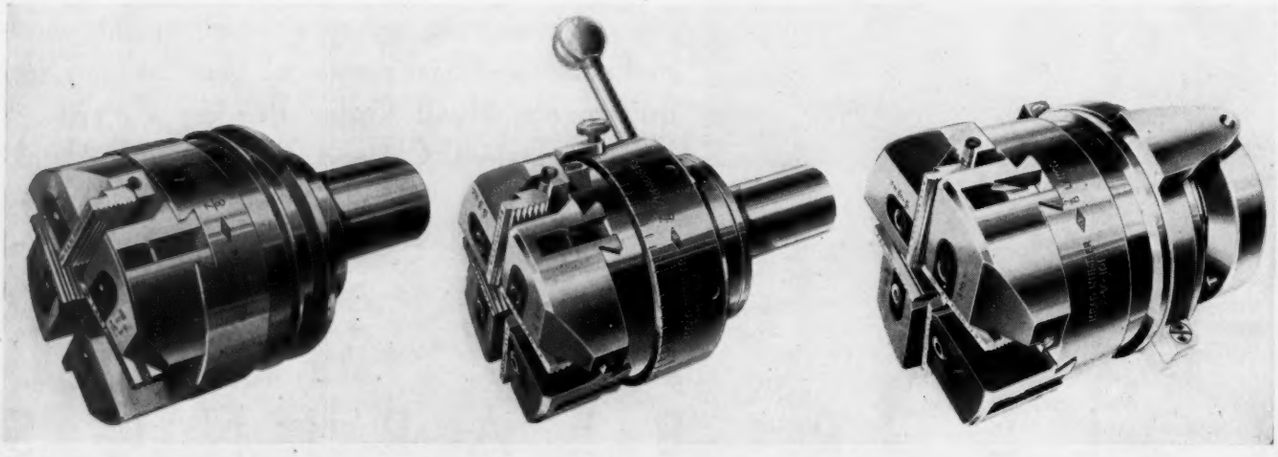


POSITION of chaser holders is controlled by prongs on the closing ring. Movement of the closing ring is actuated by spring pressure acting upon the closing ring itself

Movement of the closing ring is controlled by a locking ring. In the view depicted immediately above, the locking ring is shown in the "open" position of the die head. In closing the die head the locking ring is rotated on the head body, and, through tapered surfaces, it forces the closing ring forward. Four offset surfaces on the front of the locking ring hold the closing ring in the "locked" position. Opening and closing of the Lanco head, type V, and Landex head, type L, is obtained through a yoke. The Landmatic head, type H, may be opened and closed either automatically or by hand. The automatic opening action is obtained merely by interrupting the forward movement of the die head on to the work.

Mechanism for adjusting the die heads to size consists of a threaded collar which screws on to the head body and which is in direct contact with the locking ring. The adjusting ring may be locked in position after the size adjustment has been made. The ring is graduated and each division gives an adjustment of exactly 0.001 inch in the pitch diameter of the thread. The graduations are clearly marked and widely spaced so that adjustments as fine as 0.00025 inch are possible.

Chaser holders used in this new series of die head are designed to facilitate the changing of chasers, to permit of a more accurate setting of the chasers with relation to the cutting center, and to afford a rigid support for the chasers. A comparatively short chaser clamp, operated by a single hollow head screw, is

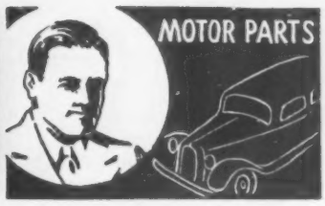


Threading die heads, Landex type L, Landmatic type H, and Lanco type V, developed by the Landis Machine Co. Inc.

"It costs little to 'dress up' our line with the Udylite-Cadmium finish and it has helped our sales considerably. The finish attracts attention and is rust-proof."

"We had trouble with coatings chipping off on bending until we discovered Udylite-Cadmium. It is ductile and will stand severe bends without damage."

"When a lock mechanism rusts, it will not operate smoothly and is useless. We use Udylite-Cadmium for rust prevention and because it gives a nice appearance."



"In automotive construction, parts are made so that they can be adjusted. Rust interferes with easy adjustment. We overcome this difficulty with Udylite-Cadmium."

"UDYLITE·CADMIUM *is the Ideal* PROTECTIVE FINISH"

"Udylite-Cadmium resists soaps and washing powders used in the laundry. This allows us to use steel, Udylite-Cadmium coated, in place of expensive alloys."

"We use Udylite-Cadmium for a number of reasons. It provides our parts with a permanent, lustrous finish. It is easy to solder and does not create stray currents."

"Rusting would undermine the strength of our many thin steel sections. We insist on Udylite-Cadmium for protection."

say MANUFACTURERS who know

THOUSANDS of manufacturers of a broad variety of metal products specify Udylite-Cadmium. Why? Read the comments reproduced on this page. They will give you an idea of the triple advantages of Udylite-Cadmium—efficient rust protection, beauty and low cost.

Udylite-Cadmium is a non-porous electrodeposit of pure metallic cadmium applied simply and quickly by the Udylite Process. As a rust preventive, it heads the list of the protective metals. In addition, the coating possesses a silvery-white lustre that is very attractive to the eye.

Udylite-Cadmium offers in one combination, advantages beyond the scope of any other electrodeposited metal. We would like to demonstrate its possibilities as a finish for your product. Write for a sample part coated with Udylite-Cadmium. Udylite Process Company, 3953 Bellevue Ave., Detroit, Mich.

Write for your copy of our catalog

UDYLITE PROCESS COMPANY

DETROIT • NEW YORK • CHICAGO • SAN FRANCISCO

The Udylite Process Company carries a complete line of electroplating equipment and supplies. It is in a position to meet any plating requirement with quality merchandise. Let us quote on your next order.

employed for holding the chaser in the chaser holder. The clamp seats in a socket with a tapered bottom. When the clamp is drawn down, the clamping action is toward the base and back of the chaser holder, thus seating the chaser firmly. A lip extending along the top of the chaser holder, and protruding slightly beyond the front of the clamp, properly supports the cutting edge of the chaser and prevents the chaser from being thrown out of alignment.

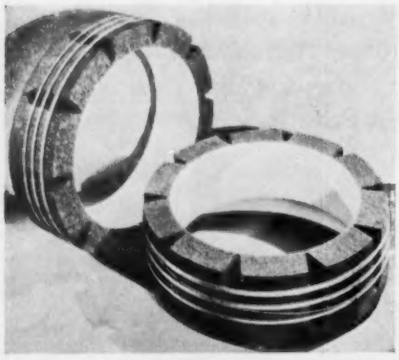
Chaser seat in the holder is ground at an angle to the face of the die head. When the chaser is clamped in the holder, it is inclined at an angle to the work.

The die heads can be employed for cutting both right and left-hand threads by using the proper chaser holders. The same chasers are used for right and left-hand work by grinding the cutting angles at both ends of the chasers. In setting the chasers to the correct cutting position, a chaser setting gage, which is similar to a straight edge, is laid on a ground surface on the side of the chaser holder adjacent to the cutting edge. The chaser then is moved forward in the chaser holder by means of an abutting screw until the cutting edge of the chaser touches the side of the gage.

◆

Introduces Sector-Type Grinding Wheel

Blanchard Machine Co., Cambridge, Mass., has added a new type wheel called the sectored wheel, to its line of grinding wheels and segments. The



Sectored grinding wheel marketed by Blanchard Machine Co.

sectored wheel which is shown in the accompanying illustration is made in one piece with a straight inner wall, and a series of notches in the outer wall. The inner wall is said to carry water down to the face and also give a continuity to the face that prevents pounding. It also is claimed that the external notches do not collect dirt, and are shaped to equalize the work performed by the abrasive grains at different circumferences. According to the manufacturer tests show that the wheel has ample strength for heavy duty. It is made in the 18 x 5 x 14-inch size for the firm's No. 16 grinder.

◆

Oxygen, Acetylene Regulators Provide Pressure Control

Air Reduction Sales Co., Lincoln building, New York, recently placed on the market two-stage reduction oxygen and acetylene regulators which automatically maintain pressure and flow without fluctuation from start to finish of cylinder discharge. The oxygen regulator is shown in the accompanying illustration. Counterbalancing effect of the two-stage reduction design automatically compensates for drop in

Two-stage oxygen regulator designed by Air Reduction Co.

cylinder pressure, assuring delivery of a constant volume of gas to the torch. Once the working pressure is set, no further attention is required.

A visible signal, showing red, immediately warns the operator of a leak at the first stage seat. Valve seats are made of rubber compositions, selected for their combination of hardness, resiliency and ability to withstand abrasion. A glass wool strainer located in the intake, protects working parts by preventing dust and dirt from entering the regulator. Cause of seat ignition is eliminated by a dead-end passage.

◆

Graphite Is Dovetailed into Bushing Metal Structure

Johnson Bronze Co., New Castle, Pa., has developed new graphited bushings, shown herewith. More

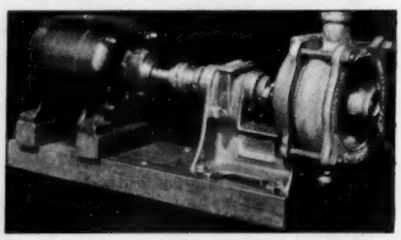
Graphite bushing which is being offered by Johnson Bronze Co.

than 40 per cent of the entire bearing surface of these units provides graphite contact with the shaft. Graphite lubricant is dovetailed into the bronze metal structure and is not soluble in water, oil or gasoline. If oil or grease is applied it penetrates the graphite lubricant and aids in the efficiency of the bearing. Minutely spaced alternating metallic and graphited surfaces produce a structure similar to that found in preferred bearing alloys.

◆

Centrifugal Pump Handles Corrosive Chemicals

Duriron Co. Inc., Dayton, O., recently developed a new centrifugal pump for handling corrosive chemicals. The unit, shown herewith, has a 1-inch suction, 1-inch discharge, and at 1750 revolutions per minute the head and capacity range from 2½ gallons per minute at a 25-foot head to 25 gallons per minute at a 5-foot head, with power consumption varying from approximately ¼ horsepower to less than ½ horsepower, these figures being based on water. Pumps are procurable in a variety of materials best suited for resistance to the various conditions which might be encountered in pumping chemicals. Either belt or direct motor drive is available. A closed-type impeller is employed.



Centrifugal pump for corrosive chemicals, built by Duriron Co. Inc.

Public Work Developing Larger Steel Tonnage

Awards Rise to 22,075 Tons, as Other Requirements Shrink—Rail Buying Expected To Provide Further Lift—Operations Continue Downward

STEELMAKERS are looking farther into the future for substantial improvement in demand, and believe only a combination of public works, railroad and automotive requirements can induce a vigorous rebound in steelworks operations.

That the decline which carried the steel rate down to 30 per cent during the past week will be arrested soon is possible, if from no other reason than the exhaustion of general consumers' stocks. But for a strong comeback much depends on how soon the government's plans can be matured into steel orders.

Failure of federal recovery programs to sustain manufacturing enterprises dependent on steel, and interruptions due to strikes principally in the automotive industry, accentuating the seasonal slowing in production, is discouraging to steelmakers. October was the first month under the steel code contract agreements, and less than 50 per cent of the material consumers contracted for was actually ordered out.

Rail Releases To Extend Over Winter Months; Method of Quoting Materials May Be Revised

The general reaction in the steel industry to the reduction in rail prices submitted to the government for 884,000 tons is that it should stimulate purchasing. But actual releases of these orders may be spread out over the winter months, owing to railroads' aversion to paying interest charges before they can use the rails. Reports are heard concerning the possibility of federal financing for cars and locomotives. A committee is considering a revision of the code system of quoting steel prices to the railroads.

Public construction work is the most promising outlet for steel, and mills should get the full benefit of many important projects this year. Structural awards for the week rose to 22,075 tons, including 4100 tons for a Mississippi river dam. For immediate action, 33,000 tons are pending in three projects in New York, and 25,000 tons for several middle western federal-aid jobs. Bids are being taken on 10,400 tons for a hospital in New Orleans.

Orders for cast pipe for work partially financed with government funds are developing more frequently. Aberdeen, S. Dak., has placed 2500 tons; International Falls, Minn., is closing on 2000 tons. Japanese pipemakers submitted lower bids than American or British interests on 25,000 tons for Mexico City, for pipe with thinner walls.

Sheet mills, back to the level of operations of last March, may derive some advantage from increasing production of refrigerators and radios. The largest galvanizing contract placed since the World war, for coating 6000 tons of plates, has been awarded to a Pittsburgh interest. Improvement in agricultural implements is not yet reflected in steel purchasing. Canmakers, buying heavily ahead of the expected advance in tin plate, are keeping tin plate mills working at 95 to 100 per cent.

Further Price Advances Due; Scrap Weak Ore Shipments Closing at 21,300,000 Tons

Price increases are anticipated shortly on cold-finished steel bars, boiler tubes, and cast pipe. A revision in warehouse differentials put in effect during the week lifts prices, by making it necessary for buyers to order larger quantities before obtaining discounts.

Prices of by-product coke are being raised; the recent increase in furnace fuel, however, has not led to a commensurate rise in pig iron, with October pig iron shipments below the September level, and declining scrap prices engendering stronger competition from that material. Lake Superior iron ore producers are completing shipments this week, the total for the season approximately 21,300,000 tons.

Due to a heavy decline in scrap, iron and steel exports for September, 108,799 gross tons, were 10,575 tons less than in August, though exports of finished steel increased. Imports continued to rise, to 55,706 tons in September, largest for any month in 1932 or 1933.

Steelworks operations last week dropped 13 points to 38 per cent in the Youngstown district; 11, to 36 in the Wheeling district; 9, to 36 at Chicago; 6, to 29 at Pittsburgh; 3, to 20½ in eastern Pennsylvania; 2, to 80 in New England. Cleveland advanced 3 points to 36. Detroit remained at 55, Birmingham at 30, and Buffalo at 24. A reduction below 30 per cent in the national average is expected this week.

STEEL's iron and steel composite is unchanged at $31.59; the finished steel composite remains $49.20; while the scrap index is off 12 cents to $10.17.

COMPOSITE MARKET AVERAGES

	Oct. 28	Oct. 21	One Month Ago Sept., 1933	Three Months Ago July, 1933	One Year Ago Oct., 1932	Ten Years Ago Oct., 1923
Iron and Steel Composite	$31.59	$31.59	$31.30	$29.81	$29.32	$43.84
Finished Steel Composite	49.20	49.20	48.52	47.20	47.64	67.77
Steelworks Scrap Composite	10.17	10.29	10.83	10.66	6.96	14.25

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Oct. 28, 1933	Sept. 1933	July 1933	Oct. 1932
Finished Material				
Steel bars, Pittsburgh	1.75	1.60	1.60	1.60
Steel bars, Chicago	1.80	1.65	1.70	1.70
Steel bars, Philadelphia	2.04	1 91	1.91	1.91
Iron bars, Chicago	1.60	1.60	1.65	1.65
Shapes, Pittsburgh	1.70	1.60	1.60	1.60
Shapes, Philadelphia	1.90	1.81½	1.65	1.75
Shapes, Chicago	1.75	1.65	1.70	1.70
Tank plates, Pittsburgh	1.70	1.60	1.60	1.60
Tank plates, Philadelphia	1.88	1.79½	1.49½	1.79½
Tank plates, Chicago	1.75	1.65	1.70	1.70
Sheets, No. 10, blue anneal., Pitts.	1.75	1.70	1.75	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.10
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.80
Sheets, No. 10, blue anneal., Gary	1.85	1.75	1.75	1.80
Sheets, No. 24, hot ann., Gary	2.35	2.35	2.35	2.20
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.85
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.10	2.05	1.95
Tin plate, per base box, Pitts.	4.65	4.65	4.25	4.75
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Oct. 28, 1933	Sept. 1933	July 1933	Oct. 1932
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	17.86	15.76
Basic, valley	17.00	17.00	15.60	14.00
Basic, eastern, del. eastern Pa.	17.76	17.76	16.79	13.60
No. 2 foundry, del. Pittsburgh	18.76	18.76	17.36	15.76
No. 2 foundry, Chicago	17.50	17.50	16.75	15.50
Southern No. 2, Birmingham	13.50	13.50	12.60	11.00
No. 2X, Eastern, del. Phila.	18.63	18.63	17.28	14.01
Malleable, valley	17.50	17.50	16.10	14.50
Malleable, Chicago	17.50	17.50	16.75	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.04	23.04
Gray forge, del. Pittsburgh	18.38	18.26	16.93	15.63
Ferromanganese, del. Pittsburgh	87.24	87.24	84.44	73.24
Scrap				
Heavy melting steel, Pittsburgh	$12.25	13.00	12.70	9.50
Heavy melting steel, eastern Pa.	10.00	10.70	12.00	7.25
Heavy melting steel, Chicago	8.75	10.00	10.45	6.00
No. 1 wrought, eastern Pa.	10.50	11.60	13.00	7.25
No. 1 wrought, Chicago	8.70	9.25	10.20	5.60
Rails for rolling, Chicago	11.00	11.25	11.15	8.00
Coke				
Connellsville, furnace, ovens	3.75	2.50	2.40	2.00
Connellsville, foundry, ovens	4.25	3.15	2.85	2.75

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88½c
New York, del.	2.08c
Phila., del.	2.04c
Birm., base	1.90c
St. Louis, del.	2.07c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.90c
Gary, base	2.00c
Chicago, del.	2.03½c
Phila., del.	2.19c
New York, del.	2.23c
St. Louis, del.	1.97c
Birm., base	2.05c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38½c
New York, del.	2.58c
Phila., del.	2.54c
Birm., base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98½c
Phila., del.	3.14c
New York, del.	3.18c
Birm., base	3.00c
St. Louis, del.	3.17c
San Fran., f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.82c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pitts., No. 10	2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh Gary base, 10 cents higher.

Tin plate, coke base, contract	$4.65
Do., stock	4.05
Long ternes, No. 24 unassorted	2.90c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot Strip	17c	18.5c	21c	26c
Cold Strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Phila., del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birm., base	1.85c
Coatesville, base	1.80c
Sparrows Pt., base	1.80c
Pac. Coast, f.o.b. St. Louis, del.	1.97c
cars, dock	2.25c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birm., base	1.85c
Pac. Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birm., base	1.90c
Buffalo, base	1.85c
Pac. Coast ports, cars, dock, c.i.f.	2.30c
Cleveland, base	1.80c
Philadelphia, del.	2.04c
Boston, del.	2.19c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Chicago, base	1.60c
Philadelphia, base	1.74c
Pitts., refined	2.75c-7.50c

REINFORCING
New billet

Pittsburgh, cut lengths	1.80c
Chicago, Buffalo, Cleveland, Birm., Young.	1.85c
Gulf ports	2.20c
Pacific coast ports	2.35c
Phila., del.	2.19c

Rail steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Gary, Young	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices on carloads. Mixed carloads up 10c; joint carloads up 20c; less carloads up 30c. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized fence wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00
Plain wire, 6-9 gage to mfg. trade	2.10c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Bars □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland, Buffalo up 5c; Detroit up 20c; eastern Michigan up 25c.

Shafting □ □ □

Turned and ground, Pitts. base

1½-inch	3.25c
1 15/16 to 1½-inch	2.75c
1 7/16 to 1 7/8-inch	2.60c
1 11/16 to 2 7/8-inch	2.45c
2 11/16 to 6-inch	2.30c

Alloy Steel □ □

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O., 2.45c. F.o.b. Bethlehem, Pa., 2.55c.

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon van.			0.95
9250 carbon base plus extras			

Strip and Hoops □

Hot-rolled strip up to 23 1/8-in wide, Pitts.	1.75c
Do., Chicago	1.85c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

*Stand. rails, mill.	$37.75
Relay rails, Pitts.	
20-45 lbs.	$24.50
50-75 lbs.	$20.00
80-100 lbs.	$23.50
Light rails, billet qual., Pitts., Chi., gross ton	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., Pitts.	2.40c
Track bolts, base	3.40c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs. up $1; 12 lbs., up $2; 8 and 10 lbs. up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	70 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	66 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc., c.l., Pitts. Cleve.	2.75c
Struc., c.l., Chi.	2.85c
7/16-in. & smaller, Pitts., Chi., Cleve.	70 and 10 off
*Wrought washers, Pitts., Chi., Phila.	6.00 to 6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
*Steel piling, Pitts.	2.00c
*Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard comercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Gary, Ind., Lorain, O., to consumers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD
Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE
Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½

Iron

1/8—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts. under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron: Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES

Cold Drawn			
2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	46

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled			
2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs. to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in., Chicago	46.00-47.00
6 to 24-in., Chicago	43.00-44.00
6-in. & over, N. Y.	34.50-36.50
4-in., New York	36.50-38.50

Class A pipe $3 over Class B. Stand. fitgs., Birm, base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Nonferrous Mill Products

F.o.b. mill base, cents per lb., except as specified. Copper, brass products based on 9.00c, Conn., copper

Sheets

Yellow brass (high)	14.75
Copper, hot rolled	17.12½
*Lead, cut to jobbers	8.00
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass	16.37½
Seamless copper	16.62½

Rods

High yellow brass	12.25
Copper	13.87½

Anodes

Copper, untrimmed	14.50

Wire

Yellow brass (high)	14.75

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

*New York	4.25- 4.75
*Chicago	4.00- 4.25
*Cleveland	4.25- 4.75
St. Louis	4.50- 4.75

Heavy Copper and Wire

*New York	5.87½-6.12½
*Chicago, No. 1	6.00- 6.25
*Cleveland	5.00- 5.50
St. Louis	5.25

Composition Brass Borings

*New York	4.00- 4.25

Light Copper

*New York	5.12½-5.37½
*Chicago	4.75- 5.00
*Cleveland	4.50- 5.00
St. Louis	5.00

Light Brass

*Chicago	2.50- 2.75
*Cleveland	2.50- 3.00

Lead

*New York	3.25- 3.37½
*Cleveland	3.00- 3.25
Chicago	2.75- 3.00
*St. Louis	2.75- 3.00

Zinc

New York	2.25- 2.50
Cleveland	2.25- 2.50
Chicago	2.25- 2.50
*St. Louis	2.25- 2.50

Aluminum

Clips, soft, Cleve.	11.50-12.00
Borings, Cleve.	4.75- 5.00
Mixed, cast, Cleve.	7.25- 7.50
*Mixed, cast, St. L.	7.00- 7.50

Secondary Metals □

*Brass ingot, 85-5-5-5	8.75
*Remelt Al., No. 12	12.00-12.50

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$17.50	$18.00	$17.00	$18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
From Swedeland, Pa., del. to Phila.	18.26	18.76	17.76	.....
From Bethlehem, del. to Brooklyn..	19.77	20.27	.....	.....
From Bethlehem, del. to Newark, N. J.	18.99	19.39	.....	.....
Basing Point:				
Everett, Mass	18.00	18.50	17.50	19.00
From Everett, del. to Boston	18.50	19.00	18.00	19.50
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	18.50	19.00	18.00	19.50
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh	(Neville Island base, plus 50 to 76 cents switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O...	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul.....	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee..	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	(Granite City base, plus 50-cent switching charge)			
Basing Point:				
Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham del. to:				
Boston	18.12	.....	17.62	.....
Newark, N. J.	18.51	.....	.....	.....
Brooklyn, N. Y.	19.39	.....	.....	.....
Baltimore	18.02	.....	17.52	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.23	.....	17.11	.....
Chicago	18.16	.....	19.14	.....
St. Louis	17.62	.....	17.50	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$22.00. Basing point: Johnson City, Tenn.—.....

Philadelphia, standard and copper bearing..... 23.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base: 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—27.25; 11—$28.75; 12—$30.25; 13—31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish low phos.	8.50
Spanish, No. Afr. basic, 50 to 60%	7.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%..	21.00-22.00
So. Afr., 49-51%....	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala....	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point....	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 and 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts. and Chicago	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.75
Connellsville fdry.	4.25
*Connell. prem. fdry.	5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.00
Chicago, del.	8.75
New England, del.	10.50
St. Louis, del.	8.75
Birmingham, ovens	4.75
Indianapolis, del.	8.75
Ashland, Ky., Connells., basis	5.50
Portsmouth, ovens, Connell. basis	5.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del	9.00

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent.	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrodhrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton., frt., all., lb.	7.00
Do, under 1 ton	7.50
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Coke By-Products

Per gallon, producers' plants, Tank lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb., f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do., (100 lb.)	0.173c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb., Atlantic seaboard

Sulphate of ammonia	$1.20

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	2.60c
Boston††	2.65c
Buffalo	2.95c
Chattanooga..	3.05c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	2.40c
Los Ang.	3.30c
New Orleans	3.00c
New York‡(d)	3.17c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS ☐

Baltimore* ...	2.60c
Boston	3.25c
Chattanooga..	3.05c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS ☐

Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga..	3.05c
Chicago	1.95c-2.10c
Cincinnati	3.10c
Cleveland	2.22½c
Detroit	2.85c
Houston	3.00c
Los Ang. cl....	3.00c
New Orleans	3.00c
New York	3.17c
Phila.	2.62½c
Pittsburgh	3.00c
S. Fran. f.o.b.	3.15c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES ☐

Baltimore* ...	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.60c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES ☐

Baltimore* ...	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker	3.21c
Cleve., 3/16-in	3.20c
Detroit	3.30c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles ..	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE ☐

Baltimore* ...	2.75c
Boston††	2.65c
Buffalo	3.10c
Chattanooga..	3.50c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Ang.....	3.45c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.75c
Pitts.	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis	3.19c-3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK ☐

Balt.*†	3.50c
Boston††	3.75c
Buffalo	3.25c
Chattanooga..	4.00c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.40c
Pitts.	3.35c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS ☐

Balt.*†	3.75c
Buffalo	4.00c
Boston††	4.25c
Chattanooga..	4.25c
Chicago	4.20c-4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.35c
New York	4.25c
Pitts.**	3.95c-4.20c
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS ☐

Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.25c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det. 3/16-in. & lighter ..	3.28½c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia...	2.90c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.45c

HOOPS ☐

Baltimore	2.80c
Boston	4.90c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det. No. 14 & lighter ..	3.28½c
New York	3.42c
Philadelphia...	3.15c
Pittsburgh	3.75c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL ☐

Baltimore (c)	3.33c
Boston 3.68c-4.18c	
Buffalo	3.25c
Chattanooga*	3.90c
Chicago	3.25c
Cincinnati	3.55c
Clevel'd, flats	3.40c
Do., rounds squares, hexagons	3.25c
Detroit	3.40c
Los Ang.	5.85c
New Orleans ..	4.25c
New York	3.79c
Philadelphia..	3.58c
Pittsburgh	3.20c
Portland (f)..	4.75c
San Fran. (d)	5.85c
Seattle (f).....	4.75c
St. Paul	3.20c
St. Louis	3.75c
Tulsa	4.65c

COLD ROLL. STRIP ☐

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b) ..	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Philadelphia..	4.55c
New York	4.55c

(a) Rounds, hex. only

(b) Net base straightening, cutting boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

(f) Rounds only.

‡Domestic bars.

*Plus quan. extras.

**Under 25 bundles.

*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York and St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 26

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	
Foundry, 2.50-3.00 Silicon.	$13.86	2 18 6	$8.52	1 15 0
Basic bessemer..	12.80	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	14.22	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets	$24.89	5 5 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	35.55	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$36.74	7 15 0	$26.77	5 10 0
Merchant bars	1.43c	6 15 0	.66c	3 0 0
Structural shapes	1.56c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm.....	1.70c	8 0 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.96c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr...	2.39c	11 5 0	1.60c to 1.76c	7 5 0 to 8 0 0
Bands and strips	1.64c	7 15 0	.83c	3 15 0
Plain wire, base	1.86c	8 15 0	1.18c	5 7 6
Galvanized wire, base.....	2.23c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.54c	12 0 0	1.27c	5 15 0
Tin plate box 108 lbs.....	$ 3.97	0 16 9	....	.....

British ferromanganese $82 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.....	$14.81	3 2 6(a)	$12.64	215	$12.78	305	$22.52	63
Basic bessemer pig iron....	13.98	2 19 0(a)*	10.88	185	12.15	290	24.92	69.50
Furnace coke	3.38	0 14 3	7.06	120	4.61	110	6.90	19.25
Billets	24.89	5 5 0	23.81	405	18.44	440	34.60	96.50
Standard rails	1.75c	8 5 0	1.89c	700	2.09c	1,100(b)	2.15c	132
Merchant bars	1.46c	6 17 6	1.51c	560	1.02c	535	1.79c	110
Structural shapes	1.86c	8 15 0	1.49c	550	1.02c	535	1.75c	107.50
Plates, †¼-in. or 5 mm.....	1.80c	8 10 0	1.84c	680	1.28c	675	2.07c	127
Sheets, black	2.17c	10 5 0§	2.30c	850‡	1.43c	750‡	2.35c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.70c	12 15 0	3.92c	1,450	3.03c	1,450	6.03c	370
Plain wire	1.86c	8 15 0	3.05c	1,130	2.47c	1,300	2.89c	177
Bands and strips	2.01c	9 10 0	1.76c	650	1.28c	675	2.07c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b Since January.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dealers	6.00- 6.25
Buffalo, No. 1	9.50-10.00
Buffalo, No. 2	8.00- 8.50
Chicago	8.50- 9.00
Cleve., No. 1	10.00-10.50
Cleve., No. 2	9.50-10.00
Detroit, No. 1	7.00- 7.50
Detroit, No. 2	6.25- 6.75
Eastern Pa.	10.00
Eastern Pa., No. 2..	9.50
Federal, Ill.	8.25- 8.75
Granite City, Ill.	8.00- 8.50
N. Y., deal. R. R.	7.50
N. Y., deal. No. 2	6.50
Pitts., No. 1	12.00-12.50
St. L., No. 1 del.	9.25- 9.75
Valleys, No. 1	12.50-13.00

COMPRESSED SHEETS

Buffalo, dealers	8.00- 8.50
Chi. (Factory)	7.25- 7.75
Cleveland	9.25- 9.75
Detroit	7.00- 7.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	12.00-12.50
Valleys	12.00-12.50

BUNDLED SHEETS

Buffalo	5.50- 6.00
Cincinnati, del.	5.75- 6.25
Cleveland	7.75- 8.25
Eastern Pa.	9.00- 9.50
Pittsburgh	11.00-11.50
St. Louis	6.00- 6.50

SHEET CLIPPINGS LOOSE

Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	5.00- 5.50
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	10.00-11.00
Boston, dealers	6.00- 6.25
Buffalo	12.00-12.50
Chicago (3 ft.)	10.50-11.00
Chicago (2 ft.)	11.00-11.50
Cincinnati, del.	11.00-11.50
Detroit	8.50- 9.00
Pitts., (open-hearth, 3 ft. and less)	14.00-14.50
St. Louis	10.50-11.00

STOVE PLATE

Birmingham	6.50- 7.00
Boston, dealers	4.50- 4.75
Buffalo	8.50- 9.00
Chicago, net	6.00- 6.50
Cinci., deal.	6.50- 7.00
Detroit, net	4.50- 5.00
Eastern Pa.	8.00- 8.50
N. Y., deal. Fdry.	6.00
St. Louis	7.00- 7.50

COUPLERS, SPRINGS

Buffalo	11.50-12.00
Chicago	10.00-10.50
Eastern Pa.	13.00-13.50
Pittsburgh	14.00-14.50
St. Louis	10.00-10.50

ANGLE BARS—STEEL

Chicago	9.75-10.25
St. Louis	9.50-10.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.50
Cleveland bil. and bloom crops	12.50-13.50
Eastern Pa. crops..	14.00-14.50
Pittsburgh billet bloom crops	14.00-14.50
Pitts., sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	9.00- 9.50
St. Louis	10.00-10.50

SHOVELING STEEL

Chicago	8.50- 9.00
Cleveland	10.50-11.00
St. Louis	8.25- 8.75

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	2.00- 2.50
Buffalo, No. 1	7.00- 8.00
Buffalo, No. 2	9.50-10.00
Chi., No. 1, net	7.50- 8.00
Chi., No. 2	8.50- 9.00
Cinci., No. 2	8.50- 9.00
Eastern Pa.	10.50
N. Y., No. 1 deal.	7.00- 7.50
Pitts., No. 1	12.00-12.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	8.25- 8.75

SPECIFICATION PIPE

Boston	4.00- 4.50
Eastern Pa.	9.50
N. Y., deal.	4.75- 5.25

BUSHELING

Buffalo, No. 1	8.00- 8.50
Chicago, No. 1	7.50- 8.00
Cinci., No. 1 deal.	6.25- 6.75
Cinci., No. 2	2.75- 3.25
Cleve., No. 2	7.00- 7.25
Det., No. 1 new	6.25- 6.75
St. Louis, No. 1	6.50- 7.00
Val. new No. 1	12.50-13.00

MACHINE TURNINGS

Birmingham	3.50- 4.50
Boston, dealers	2.25- 2.50
Buffalo	6.25- 6.50
Chicago	5.00- 5.50
Cinci., deal.	5.00- 5.50
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	6.50
N. Y., deal.	4.00- 4.50
Pittsburgh	9.00- 9.50
St. Louis	4.50- 5.00
Valleys	10.75-11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	6.25- 6.50
Cinci., deal.	4.75- 5.25
Cleveland	7.25- 7.50
Detroit	6.00- 6.50
Eastern Pa.	5.50- 6.00
N. Y., deal.	3.00
Pittsburgh	8.00- 8.50

CAST IRON BORINGS

Birming., plain	3.50- 4.50
Boston, chem.	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.25- 6.50
Chicago	5.50- 6.00
Cinci., deal.	4.75- 5.25
Cleveland	7.25- 7.50
Detroit	6.00- 6.50
E. Pa., chem.	12.00-15.00
N. Y., deal.	3.00
Pittsburgh	8.00- 8.50
St. Louis	4.50- 5.00

PIPE AND FLUES

Cinci., deal.	4.50- 5.00

RAILROAD GRATE BARS

Buffalo	5.00- 5.50
Chicago, net	6.25- 6.75
Cincinnati	4.75- 5.25
Eastern Pa.	8.00- 8.50
N. Y., deal.	5.25- 5.50
St. Louis	6.00- 6.50

FORGE FLASHINGS

Boston, dealers	5.00- 5.50
Buffalo	8.00- 8.50
Cleve., over 10-in.	9.00- 9.50
Detroit	5.75- 6.25

FORGE SCRAP

Boston, dealers	4.00- 4.50
Chicago (heavy)	10.50-11.00
Eastern Pa.	10.00-10.50

ARCH BARS, TRANSOMS

Chicago, net	7.00- 7.50
St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.50- 3.75
Buffalo	7.50- 8.00
Chi., elec. fur.	7.50- 8.00
Cleveland	9.50-10.00
Eastern Pa.	9.50-10.00
St. Louis	5.50- 6.00

STEEL CAR AXLES

Birmingham	8.00- 9.00
Boston, ship. point..	8.00- 8.50
Buffalo	10.00-11.00
Chicago, net	10.00-10.50
Eastern Pa.	15.00
St. Louis	11.50-12.00

SHAFTING

Boston, ship. point	9.25-9.50
Eastern Pa.	15.00
N. Y., deal	10.00-10.25
St. Louis	8.00- 8.50

CAR WHEELS

Birmingham, iron	8.00- 9.00
Boston, iron deal.	6.00- 6.50
Buffalo, iron	8.00- 9.00
Buffalo, steel	10.50-11.00
Chicago, iron	9.00- 9.50
Chi., rolled steel	10.00-10.50
Cincinnati, iron	8.00- 8.50
E. Pa., iron	12.00-13.00
E. Pa., steel	13.00-13.50
Pitts., iron	11.00-11.50
Pitts., steel	14.00-14.50
St. Louis, iron	7.50- 8.00
St. Louis, steel	10.00-10.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 2	5.00- 5.50
Boston, Tex. con.	10.75-11.00
Buffalo, cupola	9.50-10.00
Buffalo (mach.)	10.00-10.50
Chicago, agri. net	7.50- 8.00
Chi., mach. net	8.50- 9.00
Chi., railroad net	8.00- 8.50
Cinci., mach. cup	8.00- 8.50
Cleve., cupola	10.50-11.00
Detroit, net	7.00 7.50
E. Pa., cupola	12.00
N. Y., cup. deal.	6.00- 6.50
N. Y., del. local foundries	9.00- 9.50
Pitts., cupola	11.00-11.50
San Fran., del.	13.50-14.00
Seattle	4.50- 6.50
St. Louis, No. 1	8.50- 9.00
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.75- 6.00
Buffalo, break	7.00- 7.50
Cleve., break	7.50- 8.00
Detroit, break	5.00- 5.50
Detroit, auto net	8.00- 8.50
Eastern Pa.	10.00-10.50
N. Y., No. 1, deal.	7.00- 7.50
N. Y., break. deal.	6.00- 6.50
Pittsburgh	10.50-11.00

MALLEABLE

Boston, consum.	12.25-12.75
Buffalo	10.00-11.00
Chicago, R. R.	9.75-10.25
Cinci., agri. del.	8.00- 8.50
Cinci., R. R. del.	8.50- 9.00
Cleveland, rail	11.50-12.00
Detroit, auto	6.50- 7.00
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	12.50-13.00

RAILS FOR ROLLING
5 feet and over

Birmingham	9.50-10.50
Boston, dealers	7.00- 7.25
Buffalo	9.00- 9.50
Chicago	10.75-11.25
Eastern Pa.	12.50
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	10.00-10.50
St. L., No. 1	8.50- 9.00

LOW PHOS. PUNCHINGS

Buffalo	11.00-11.50
Chicago	10.50-11.00
Eastern Pa.	12.50-13.50
Pittsburgh	14.00-14.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead: N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Oct. 21	7.50	8.12½	7.25	46.00	46.30	4.00	3.90	4.75	*22.90	6.75	35.00
Oct. 23	7.50	8.12½	7.25	47.00	47.30	4.00	3.90	4.70	*22.90	6.75	35.00
Oct. 24	7.75	8.12½	7.50	48.50	48.80	4.00	3.90	4.70	*22.90	6.75	35.00
Oct. 25	8.25	8.62½	8.00	48.75	49.05	4.15	4.05	4.75	*22.90	6.75	35.00
Oct. 26	8.25	8.62½	8.00	48.62½	48.92½	4.30	4.05	4.75	*22.90	6.70	35.00
Oct. 27	8.25	8.62½	8.00	48.37½	48.62½	4.30	4.15	4.75	*22.90	6.70	35.00

*Normal quotation. Market range 19.90c to 22.90c.

Bars

Bar Prices, Page 44

Pittsburgh — Most bar users appear to be overbought. Mill operations here are off noticeably and one leading bar mill's schedule last week was decidedly slack. Open hearths and finishing mills of another leading bar mill here were closed last week. Under operation of the steel code, forging bars are quoted either base at 1.75c, Pittsburgh for commercial quality; with a 25-cent extra for what is termed "forging quality"; or with a 50-cent extra for "special requirement forging bars" wherein the latter amount of discard, extra restrictive requirements, etc. are guaranteed. Merchant steel bars are quoted 1.75c, base Pittsburgh, or 1.90c, delivered, Detroit, under operation of regulation 13 to the steel code. Most Detroit buyers are well stocked with their bar needs, having done so with the price concession they enjoyed before the steel code went into effect plus the extension of the allowance in regulation 13. Alloy bars remain based at 2.45c, Pittsburgh.

Cleveland—October was the first month in which steel was booked under the new contract forms provided by the steel code. Most of some leading producers' commitments for fourth quarter is on the so-called percentage contracts. In accordance with this form, steel not specified each month as it falls due, is automatically canceled. In the experience of some important producers less than half the tonnage contracted for October was specified. In a few instances buyers failed to cover sufficient for their needs, but the additional buying this induced was inconsequential compared with the total which was not ordered out. Few specifications to apply on November allotments have appeared and spot buying is limited to small lots, with the price steady at 1.75c, Pittsburgh.

New York—Specifications for steel bars continue to improve but new buying is light. The price is steady at 2.08c, New York.

Chicago—Steel bars share with other products in the decline in sales and specifications. Reduced activity in the automotive industry is felt keenly, while improvement in farm implement requirements is insufficient to offset the decline in consumption in other industries. Contracting has not been extensive but in view of code regulations and uncertainty in the outlook for some industries, the volume of tonnage booked is not taken as an indication of probable consumption for the quarter. Soft steel bars continue 1.80c, Chicago, with rail steel 1.70c.

Philadelphia — Commercial steel bar specifications are fairly good but little buying is developing. The same applies to iron bars in a relative degree. Commercial steel bars are 1.75c, Pittsburgh, or 2.04c, Philadelphia, and common iron bars generally 1.74c, Philadelphia.

Plates

Plate Prices, Page 44

Pittsburgh—The market is quoted firmly at 1.70c, Pittsburgh, but lack of buying since the advance has given little test. River barge work still is fairly promising although buyers are slow to close. A Chicago concern is asking bids on 24 large steel barges, wood lined. However, the buyer signifies he may not close for at least 90 days. Carnegie Steel Co. will supply 540 tons of plates for repairs to 19 barges on which American Bridge Co. is working at Ambridge, Pa. Definite award of the 700-ton Greenville, Miss., floating wharf has been held up. The former low bidder on this job is reported to have been displaced by Ingalls Iron Works, Birmingham, Ala.

Cleveland—Plate bookings for the past week barely aggregated those of many single days in September. Orders are fairly numerous, but smaller, and specifications on contracts also have shrunk. Two general contracts for Cleveland watermains requiring an additional 2500 tons of plates have been reawarded, plates not yet having been purchased. The plan finally approved for the city's easterly sewage disposal plant calls for 1140 tons of plates for the sludge basins, bids Nov. 2.

Chicago—Plate demand is fairly steady while new orders for fabricated plate products continue quiet. A fairly large number of tanks for municipal waterworks are included in the public works program and several have been placed recently, but most are for small units taking around 40 to 50 tons of plates each. Prospects for better demand from railroads are more favorable, however. A few small inquiries are pending for river craft for use on the Illinois waterway.

Boston—Plate specifications are slightly improved, but new buying at 1.80c, Coatesville, Pa., is light. New work requiring plates is heavier, including miscellaneous bridge requirements, two 35,000-barrel tanks for the navy, Melville, R. I., and a fuel storage tank, East Hartford, Conn. Plans are also being figured for a water tank for Lexington, Mass.

New York—Although inquiry for steel plates is light orders are more numerous, indicating a wider diversification. Sellers also are cheered by an improvement in contact releases. An eastern platemaker has booked 800 tons for turbines for Boulder dam, through General Electric Co., Schenectady, N. Y. Bids will be opened Oct. 30 on 3300 tons, principally bars and flats, for trash racks for the same project. The coast guard will require nine cutters instead of seven as previously noted, bids Nov. 28. These will require about 6000 tons of plates. and 900 tons of shapes and bars. Prices remain 1.98c, New York.

Philadelphia—Early action is expected on the award of the 10,000,000-cubic foot gas holder to be erected in Washington, previously noted as requiring approximately 2500 tons. Plate demand is spotty, with eastern plate operations undergoing a further decline. There are a few brewery jobs, but the total tonnage involved is relatively small. Plates are 1.80c, Coatesville, or 1.88½c, Philadelphia.

Contracts Placed

3245 tons, 8,000,000-cubic foot gas holder, Omaha, Nebr., to Stacey Bros. Gas Construction Co. Inc., Cincinnati; previously reported awarded to Stacey Mfg. Co., Cincinnati.

800 tons, for turbine for Boulder dam to unnamed eastern mill, through General Electric Co., Schenectady, N. Y.

540 tons, plates to repair side and buckle plates in 19 Carnegie Steel Co barges, to Carnegie Steel Co., Pittsburgh; repair work to be done by American Bridge Co. at Ambridge, Pa.

275 tons, 55.000-barrel tank, naval base, San Diego, to Chicago Bridge & Iron Works, Chicago.

100 tons, tanks, Old Dutch brewery, Brooklyn, to Dover Boiler Works, New York.

Unstated tonnage, 100,000-gallon steel tank on 100-foot tower, Ocean Beach, Suffolk county, New York, to Westchester Construction Co., Mount Vernon, N. Y.

Unstated tonnage, storage tank, Shell Petroleum Products Co., East Hartford, Conn., to Chicago Bridge & Iron works, Chicago.

Contracts Pending

6000 tons, nine instead of seven coast guard cutters; bids Nov. 28; 900 tons shapes and bars also included.

3300 tons, trash racks for Boulder dam; bids Oct. 30.

1214 tons, armor plate, bureau of ordnance, navy department; bids

Nov. 14, schedule 146.
1140 tons, easterly sewage disposal plant, Cleveland; bids Nov. 2.
700 tons, floating dry dock, Greenville, Miss., Ingalls Iron Works, Birmingham, Ala., low instead of Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., as reported in STEEL, Oct. 23.
600 tons, four tugs for coast guard; bids Nov. 14; 225 tons shapes and bars also included.
400 tons, lighthouse tenders, HOLLYHOCK and TAMARACK, readvertised Nov. 24, commissioner of lighthouses, Washington; bids Sept. 28 rejected.
300 tons, two 35,000-barrel fuel oil tanks, naval depot, Melville, R. I.; bids Nov. 8, bureau of yards and docks, Washington.
125 tons, two steel tanks and towers, department of agriculture; Tippett & Wood, Phillipsburg, N. J., low Beltsville Md., tank, $7640; R. D. Cole Mfg. Co., Newman, Ga., low Brookville, Fla., $5762; bids Oct. 10.
100 tons, plates and sheets, mostly former, navy, Puget Sound, Washington; bids Nov. 7.
Unstated tonnage, four to five miles, 32 or 36-inch welded steel pipe for the city of Cincinnati.

Sheets

Sheet Prices, Page 44

Pittsburgh—Sheet buying is irregular. Specifications in October were considerably under those of September. Shipments continue to be governed to a large extent by rising inventories of sheets in the plants of some users. Pittsburgh base prices are unchanged at 2.25c for black; 2.85c for galvanized sheets; 1.75c for 10 gage hot-rolled. Cold-rolled sheet prices are firmer.

Cleveland—Sheet mill operations have been reduced further. The Cleveland mill did not exceed 20 per cent for the past week, and another nearby lake district maker was slightly below 40 per cent, with lower schedules for this week. These interests in September and up to Oct. 15 were operating near capacity. The new prices have received little test; new automotive purchases have been restricted to small fill-in requirements.

Chicago—Sheet operations are tending downward as a result of quietness in new orders. Operations in practically all important sheet consuming industries are declining, with seasonal quietness in the automotive industry responsible for a large share of reduced demand. Operations of electrical refrigerator manufacturers are seasonally heavy. Production in this industry is setting a new high record this year, and in view of the favorable outlook for 1934 schedules during the winter months are expected to be higher than usual. Radio manufacturers are experiencing rather quiet business. Improvement in operations of farm implement manufacturers as yet is not reflected in sheet demand. Prices are unchanged.

Boston—With the jobbing trade well covered on sheets and industrial consumers specifying sparingly, new orders for sheets are light. One producer of small oil burner tanks continues to take fair shipments of blue annealed.

New York—Sheet buying is slow, with consumers well supplied with material. Prices are unchanged.

Philadelphia—Improved demand from radio manufacturers is noted by local sheet sellers. One radio manufacturer is stepping up operations considerably, while another is understood to have definite plans for increasing production in the near future. A sheet mill in the Baltimore district is expected to resume operations in the latter part of November.

Cincinnati—District sheet mills remain on reduced operating schedules, at about 45 per cent. New buying continues to reflect the general condition among important consumers who are carrying inventories adequate for immediate needs.

Birmingham, Ala.—Sheet demand is quiet. Better orders are expected shortly from agricultural sections.

St. Louis—Specifications have tapered considerably, and new buying also is in smaller volume. Manufacturers of stoves are ordering forward material in relatively larger volume than other consumers. Automotive demand is quiet.

Pipe

Pipe Prices, Page 45

Pittsburgh — Prospects for improvement in demand for tubular goods are slight. Pipe shares to a relatively small extent in the government's public works program and privately-sponsored line pipe is continuing difficult to finance. Standard pipe is in fair demand, especially for certain recent heating contracts, but seamless pipe business is declining. Anticipated railroad buying may result in some boiler tube orders.

Chicago — Cast pipe orders for federal aid projects are being placed more rapidly and this business is expected to increase over coming months. Aberdeen, S. Dak., has placed 2500 tons of 20-inch pipe, while several small lots have been booked in Indiana. International Falls, Minn., will require 2000 tons of 20-inch pipe and many smaller jobs are pending in other nearby states, awaiting federal approval of loans. Chicago is taking bids on 229 tons of 20-inch material. Cast pipe prices are expected to be advanced shortly.

Boston—The New England foundry has taken close to 1600 tons for Townsend, Mass. Several hundred tons of smaller orders also have been placed. Completion of financing for a number of municipal projects has brightened the cast pipe market.

New York—Nearly 1000 tons of cast pipe for Pelham, N. Y., held up, probably will be purchased following approval of a federal loan. Favorable action on financing will release inquiries for other projects. An advance in boiler tubes is expected shortly.

Birmingham, Ala.—With Mexico City reserving the right to award its inquiry for 25,000 tons of 48-inch cast pipe within 90 days, action may be delayed and the placing of this business will depend largely upon the rate of money exchange. As submitted at the opening recently, the bid of Japanese producers appears low, with the bids of the American and English producers close to one another. The Japanese, it is said, bid on a pipe of thinner wall.

Cast Pipe Placed

2500 tons, 20-inch, Aberdeen, S. Dak., to United States Pipe & Foundry Co., Burlington, N. J.
1650 tons, 6 to 12-inch, Townsend, Mass., to Warren Pipe Co. of Mass. Inc., Everett, Mass.
1300 tons, Latham, N. Y.
250 tons, Huntingburg, Ind., to American Cast Iron Pipe Co., Birmingham, Ala.
200 tons, 6 and 8-inch, Ligonier, Ind., to Glamorgan Pipe & Foundry Co., Lynchburg, Va.
200 tons, including accessories, for Lewiston, Idaho, to Pacific States Pipe Co., Provo, Utah.
200 tons, highway project, Queens, New York, to Warren Foundry & Pipe Co., Phillipsburg, N. J.

Cast Pipe Pending

2758 tons, 6 to 24-inch, class 150, Los Angeles, for delivery between Dec. 15, 1933, and May 15, 1934; bids opened.
2000 tons, 20-inch, International Falls, Minn.; federal loan applied for.
1609 to 2222 tons, 20 and 24-inch, class B or 100, Long Beach, Calif.; bids Oct. 31.
300 tons, sewage disposal system, Durham, N. C.; bids Nov. 9.
229 tons, 20-inch, Chicago; bids Nov. 3.
214 tons, sewage treatment works, Baltimore; also 1250 feet 6, 10 and 12-inch steel pipe; bids in.
170 tons, 8 and 10-inch, Quincy, Mass.; Donaldson Iron Works, Emaus, Pa., low.
150 tons, 6 and 8-inch, Vienna, Md.; bids Nov. 3.

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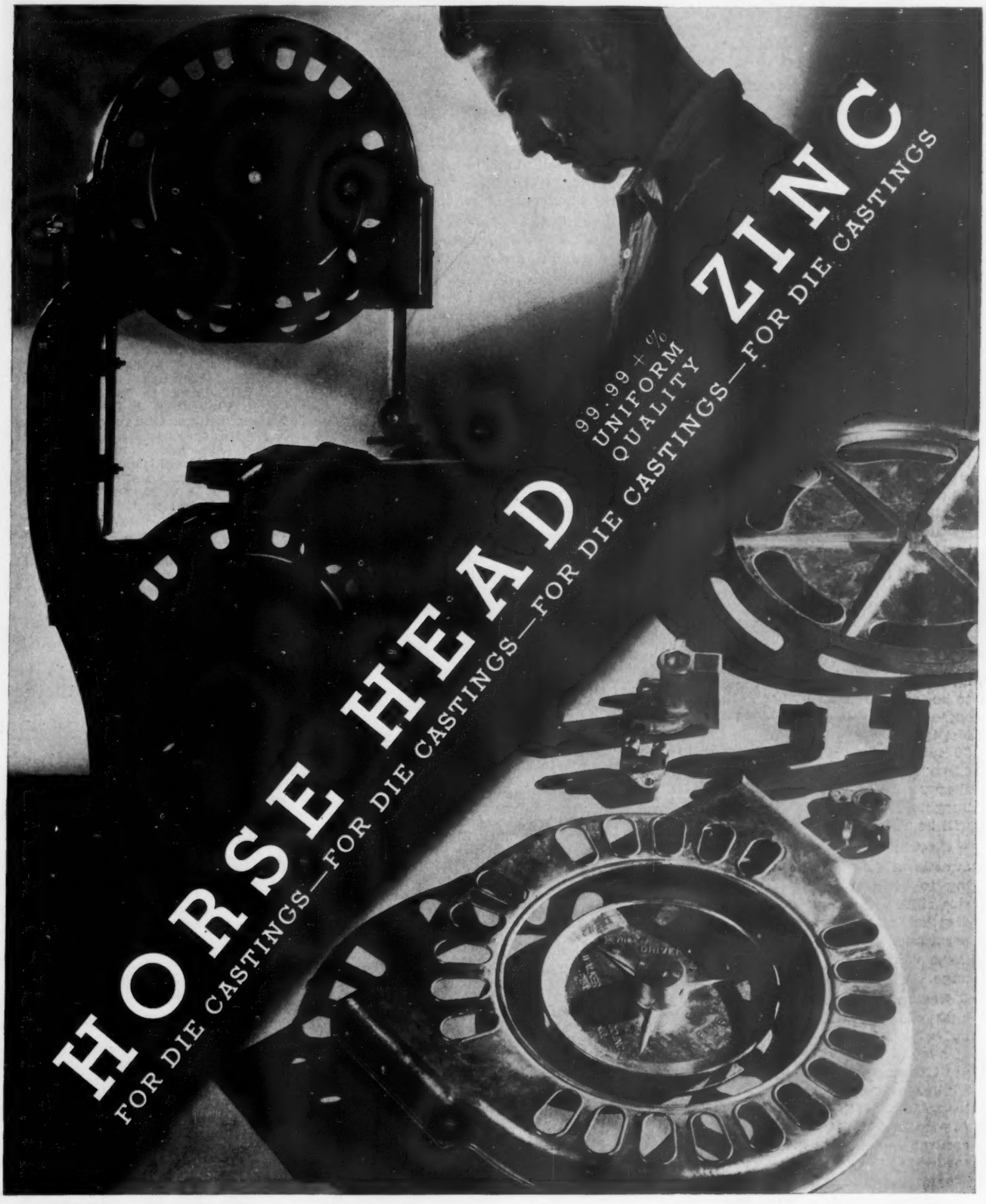

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Shapes

Structural Shape Prices, Page 44

Chicago—Structural awards of 7000 tons are entirely for public works and are headed by 4100 tons of shapes and piling for Mississippi river dam No. 5. New projects involve 21,000 tons, including 10,400 tons for a hospital at New Orleans. Bids close this week at St. Paul on 2000 tons for two Mississippi river locks with another similar project taking 1100 tons scheduled to close the following week. State bridge awards account for 1500 tons.

New York—Bids close Nov. 16 on towers for the Triboro bridge, New York, taking 12,000 tons. This inquiry, with 8000 tons for the final section, west side Manhattan elevated highway, Nov. 3, and 13,000 tons for the Manhattan midtown post office, soon to be placed with a fabricator, are the leading tonnages pending. An increasing number of small public work projects are coming out.

Pittsburgh—Bids will be taken Nov. 15 by the Pennsylvania railroad through its Pittsburgh division for an 800-ton plate girder span near East Aurora, N. Y. Three New York state highway bridges, 470 tons, are being figured by fabricators here. Bids to be taken Dec. 12 by the Pittsburgh engineers for the roller crest dam at Montgomery island in the Ohio river, 30 miles below Pittsburgh, will involve 3000 tons. Plain structural shapes are based on 1.70c, Pittsburgh. Effective Nov. 1, steel piling will be advanced to 2.00c, Pittsburgh.

Cleveland — Current structural awards are light, with steel remaining to be purchased on several fair size state jobs. The easterly sewage disposal plant here will require approximately 100 tons additional to a large reinforcing bar and plate tonnage.

Boston—Bridges account for the bulk of activity in structural steel, but with successful federal financing of several building projects additional tonnage is expected out soon. Plain material is firm at 1.80c, Bethlehem, Pa. With the exception of one fabricator, recently taking a 900-ton contract, shops are ordering out material in small lots.

Philadelphia—Shape demand is picking up slowly. With the exception of the previously noted 1000 tons for a high school in Wilmington, Del., little is out definitely for figures. Seeds & Durham, this city, have been awarded the general contract for the construction of dam No. 3 in the Alleghany river, requiring approximately 3000 tons of steel piling. Shapes are 1.80c, Bethlehem, Pa., or 1.90½c, Philadelphia.

Buffalo—New York Central railroad is expected to take bids about Dec. 1 for its $11,000,000 grade crossing elimination program in Syracuse, N. Y., taking a large tonnage of shapes and concrete bars.

Birmingham, Ala.—Road building will start early in December throughout Alabama, and steel for the work now is being estimated.

Contracts Placed

4100 tons, Mississippi river dam No. 5, Fountain City, Wis.; 2500 tons of shapes to Worden-Allen Co., Milwaukee; 1600 tons, piling, divided among Bethlehem Steel Co., Carnegie Steel Co., Inland Steel Co., and Jones & Laughlin Steel Corp.; Merritt, Chapman, Whitney Construction Co., general contractor.

3470 tons, machine shop, Bremerton, Wash., for navy department, tentatively awarded by general contractor to McClintic-Marshall Corp., Bethlehem, Pa.; definite award dependent upon approval of general contractor's bid.

2200 tons, two parallel locks, Gallipolis, Lock and Dam, Ohio river, near Hogsett, W. Va., to Dravo Contracting Co., Neville Island, Pa., also 201 tons of steel and cast iron castings, 20,000 square feet steel sheet piling, 58 tons steel forgings, and 450 tons of reinforcing bars.

1340 tons, bridge, Illinois river, Morris, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

940 tons, final assembly shop, bureau of yards and docks, navy department, San Diego, Calif., to McClintic-Marshall Corp.; B. O. Larsen, San Diego, general contractor.

730 tons, bridges, St. Francis river, Lake City-Monnette road, Arkansas, to Vincennes Steel Corp., Vincennes, Ind.

700 tons, powerhouse, Springfield, Ill., to Duffin Iron Co., Chicago.

658 tons, state overhead crossing, San Bernardino county, California, to Consolidated Steel Corp., Los Angeles.

600 tons, I-beams and channels, navy, five yards to Joseph P. Cattie & Bros., Philadelphia, except 150 tons, I-beams for Boston, Philadelphia and Norfolk, to Jones & Laughlin Steel Corp., Pittsburgh. Part of letting of Sept. 19.

550 tons, bridge, Mangum, Okla., to Virginia Bridge & Iron Co., Roanoke, Va.

500 tons, bridge over Alua river in Honduras for United Fruit Co., to unstated American fabricator.

440 tons, spinning room and boiler house, American Enka Corp., Enka, N. C., to Carolina Steel & Iron Co., Greensboro, N. C.

430 tons, sales room building for Spear & Co., Jamaica, N. Y., to Harris Structural Steel Co., New York; through Tidewater Building Co.

400 tons, bridge, Glade, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

400 tons, bridges, Buchanan county, Missouri, to St. Louis Structural Steel Co., St. Louis.

400 tons, piling, Panama City, Fla., to Inland Steel Co., Chicago.

360 tons, inspection bridge for San Francisco-Oakland bridge, to Columbia Steel Co., San Francisco.

350 tons, state bridges, Rush and Hamilton counties, and Crab Orchard, Indiana, to Vincennes Steel Corp., Vincennes, Ind.

330 tons, bridge, Otsego county, New York, to American Bridge Co., Pittsburgh; through Harrison & Burrows Inc., Brooklyn, N. Y.

270 tons, including railing and piling, overpass, I. & G. N. railroad and Sabine river bridges, Gregg county, Texas, to Austin Bros., Dallas, Tex.; Buckner Bros., Cleburne, Tex., general contractor.

260 tons, highway bridge, Biddeford, Me., to American Bridge Co., Pittsburgh.

260 tons, highway bridge, Forest service, United States department of agriculture, Idaho, to Illinois Steel Bridge Co., Jacksonville, Ill.

250 tons, state bridge, in Eagle county, Colorado, to unnamed interest.

225 tons, bridges, Kimble county, Texas, to Petroleum Iron Works Co., Beaumont, Tex.; through Earl Yates & Son, Buffalo, Tex.

225 tons, Felt Field hangar, Spokane, to Isaacson Iron Works, Seattle; J. T. Halin, Spokane, general contractor.

225 tons, state bridge R. C. 3472, Erwin-Lawrenceville, Steuben county, New York , to McClintic-Marshall Corp., Bethlehem, Pa.; Frank G. Hanssel Co., Buffalo, general contractor.

200 tons, fertilizer building, Windsorville, Conn., to Berlin Construction Co., Berlin, Conn.

175 tons, bridge, New Mexico, to American Bridge Co., Pittsburgh.

160 tons, bridge, Warren county, New York, to Fort Pitt Bridge Works, Pittsburgh; through Adams Bros. Construction Corp., Glens Falls, N. Y.

150 tons, bridge, Ranchester, Wyo., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

150 tons, office building and plant, Superior Paper Co., Carnegie, Pa., to Truscon Steel Co., Youngstown, O., through Rust Engineering Co., Pittsburgh.

135 tons, 36 I-beam spans, Arizona, to Allison Steel Mfg. Co., Phoenix, Ariz.

128 tons, state highway bridge, Farmington, Conn., to American Bridge Co., Pittsburgh.

125 tons, bridges, Minnesota, to Illinois Steel Bridge Co., Jacksonville, Ill.

120 tons, bridges, Moyle river, Idaho, to Virginia Bridge & Iron Co., Roanoke, Va.

115 tons, bridge, Delaware & Hudson railroad, Elnora, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

104 tons, shapes and bars, mainly former, state bridge, Fourchi Maline creek, near Red Oak, Okla., to J. B.

Shape Awards Compared

	Tons
Week ended Oct. 28	**22,075**
Week ended Oct. 21	**6,332**
Week ended Oct. 14	**15,486**
This week in 1932	**11,657**
Weekly average 1932	**14,285**
Weekly average, 1933	**14,283**
Weekly average, Sept.	**14,365**
Total to date, 1932	**731,490**
Total to date, 1933	**628,460**

Klein Iron & Foundry Co., Oklahoma City; T. C. Ottinger, Hinton, Okla., general contractor.

Contracts Pending

12,000 tons, towers, Triboro bridge, New York; bids Nov. 16.

10,400 tons, hospital, New Orleans.

8000 tons, last section, west side elevated highway, Thirty-eighth to Forty-sixth street, Manhattan, N. Y.; bids Nov. 3.

3800 tons, Louisiana & Arkansas railroad bridge, Norco, La.

3100 tons, trash racks, Boulder dam, Boulder City, Nev.; bids postponed from Oct. 16 to 30.

3000 tons, fabricated steel and piling, roller crest dam on the Ohio river, Montgomery island, 30 miles below Pittsburgh. Bids to Pittsburgh federal engineers, Dec. 12. Dam will be equipped with ten roller gates and a steel service bridge 1500 feet long.

2200 tons, bridge, Saugus river, Revere-Lynn, Mass.

1100 tons, Mississippi river lock, Quincy, Ill.; bids Nov. 7 to United States engineer, Rock Island, Ill.

1045 tons, piling; bids to United States engineer, Milwaukee, Nov. 1.

1000 tons, Mississippi river lock, Muscatine, Iowa; Central Engineering Co., Davenport, Iowa, low on general contract.

1000 tons, lock, Tranpaleau, Wis.; bids Nov. 2, to United States engineer, St. Paul.

1000 tons, lock, Dresbach, Minn.; bids Nov. 3 to United States engineer, St. Paul.

800 tons, plate girder span, East Aurora, N. Y., for Pennsylvania railroad; plans being drawn at Pennsylvania division headquarters, Pittsburgh.

750 tons, highway bridges, Minnesota.

720 tons, horses and props, dams Nos. 46, 49 and 50, Owensboro, Ky.

700 tons, highway bridges, Missouri.

550 tons, three hangars, marine barracks flying field, Quantico, Va.; bids Nov. 15, bureau of yards and docks, navy department, Washington.

500 tons, highway bridges, Oklahoma.

386 tons, shapes, plates and bars, mainly shapes, Panama; schedule 2913; bids Nov. 3.

350 tons, building, Zorn Brewing Co., Michigan City, Ind.

200 tons, state bridge, Arlington, Mass.

200 tons, hangar and boiler house, Ft. Benning, Ga.; bids in Oct. 30.

195 tons, New York state highway bridge, Flushing Dock, N. Y.

190 tons, beam bridge spans, department of agriculture, delivery various points, mainly in South; Ingalls Iron Works Co., Birmingham, Ala., low; bids Oct. 17.

182 tons, Tongue river bridge, project NRM 135-G, Montana; bids Oct. 28.

180 tons, building, department of public works, New York.

175 tons, coast guard air station, St. Petersburg, Fla.; bids Nov. 2.

165 tons, state bridge, Pope county, Arkansas; bids in Oct. 31. Structure also takes 75 tons of reinforcing bars.

154 tons, state highway bridge, Sequoyah county, Oklahoma; Hyde Construction Co., Enid Okla., general contractor.

150 tons, New York state highway bridge, Avoca, N. Y.

150 tons, state bridge, Charles, Dorchester and Wicomico counties, Maryland; Waller & Phillips, general contractors.

125 tons, state bridges, Putman, Pendleton and Berkeley counties, West Virginia; bids in Oct. 31. Structures take 60 tons of reinforcing bars.

125 tons, New York state highway bridge, Hornell, N. Y.

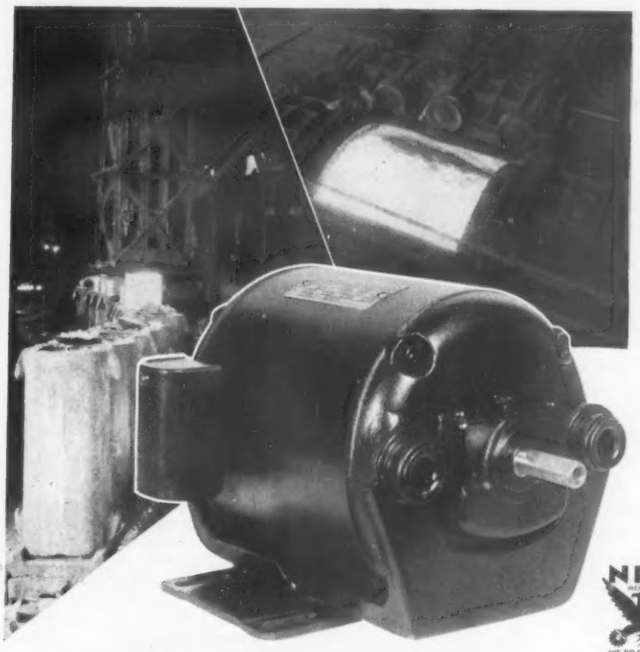
120 tons, bridge, Bellhaven, N. C.; United States engineer, Wilmington, N. C.

110 tons, West Virginia state bridge; bids Oct. 31.

Books Big Galvanizing Job

Hanlon Gregory Galvanizing Co., Pittsburgh, has received what is reported to be the largest order for job galvanizing since the World war. The order, for $250,000, is for galvanizing 6000 tons of plates for government use in various navy yards.

Columbia Steel Co., Torrance, Calif., subsidiary of the United States Steel Corp., has increased employes from 300 in January to 1100 at present. Peak production reached 6400 tons, with capacity of 7000 tons.



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Reinforcing

Reinforcing Bar Prices, Page 45

Cleveland—In addition to 800 tons of concrete bars for Cleveland's easterly sewage disposal plant, which have been pending for several weeks, 2400 tons will be required for the sludge basins, bids for which will be taken Nov. 2. About 100 tons of shapes also will be required for this job. Other requirements are light. Reinforcing bar fabricators expect to be operating under their code shortly, reporting it approved and waiting the President's signature. New billet steel bars, mill lengths, are 1.85c, base, Cleveland.

Pittsburgh—A Pennsylvania state letting Nov. 2 will require a large tonnage of mesh, estimated as high as 1000 tons. New billet steel bars for reinforcing purposes are quoted 1.80c, Pittsburgh, or 1.90c for cut lengths. Rail steel remains 1.75c, Pittsburgh. Redesigned plans on the Pittsburgh post office ramps, taking 500 tons of bars, are expected soon. Seeds & Durham, Philadelphia, were awarded the general contract last week on dam No. 3 in the Allegheny river and will require a large tonnage of bars. Purchase of almost 1000 tons in three river dam projects in this district is awaited.

Chicago — With private building construction still quiet, reinforcing bar business depends largely on activity in public works construction. The approach of colder weather will curtail road building, although other types of federal aid projects are expected to go ahead. Bids have been taken in Illinois on highway work, but only small lots of bars are involved.

Boston—New inquiry for concrete reinforcing steel is light. The largest lot pending includes about 350 tons for the East Boston-Revere, Mass., bridges. Cut length of billet steel bars are 1.95c, Buffalo; and rail steel reinforcing rods 1.80c, Buffalo.

Philadelphia—State road work in Pennsylvania and in New Jersey is adding materially to prospects in the reinforcing bar market. The largest single opening is Nov. 13 at Trenton, N. J., for 1100 tons. A government aid housing development in this city on which bids are to be opened Nov. 4, will require close to 450 tons. Prices are unchanged at 1.90c, Pittsburgh, for billet quality in cut lengths, or 2.19c, Philadelphia.

New York—Close to 700 tons of highway reinforcing steel was bought during the week and 450 tons additional came out for New Jersey, closing Nov. 13. Demand, however, is beginning to slow up after heavy buying. Prices are steady and unchanged.

Contracts Placed

650 tons, state highway, Dallas-Lowndes counties, Alabama, to Kilby Co., Birmingham, Ala.; through Espy Paving & Construction Co., Savannah, Ga.

580 tons, superstructures, Grand Island bridges, near Buffalo, to Concrete Steel Co., New York; Taylor-Fichter Steel Construction Co., general contractor.

450 tons, state bridge, highway 78, Obion river, Dyer county, Tennessee, to unstated fabricator. Virginia Bridge & Iron Co. awarded 70 tons of structural steel; A. Guthrie & Co., St. Paul, general contractor.

350 tons, mesh, highway, 6.66 miles, Loudon Road-Crescent-Cohoes spur, Albany county, New York, to Kalman Steel Corp., Bethlehem, Pa.; Sheehan Contracting Corp., Albany, N. Y., general contractor.

225 tons, plant for American Potash & Chemical Co., Trona, Calif., to Jones & Laughlin Steel Corp., Pittsburgh.

218 tons, San Gabriel dam No. 2 for Los Angeles county, California, to Soule Steel Co., Los Angeles.

200 tons, mesh, 2.49 miles, Pittsfield-New Lebanon highway 4, Columbia county, New York, to American Steel & Wire Co., New York; Lane Construction Corp., Meriden, Conn., general contractor.

169 tons, state bridges, Bexar county, Tex., to Alamo Iron Works, San Antonio, Tex.; through Earl Yates & Son, Buffalo, Tex.

161 tons, bridges, Kimble county, Texas, to Austin Bros., Dallas, Tex.; through Earl Yates & Son, Buffalo, Tex.

130 tons, bridge and approaches over Florida East Coast railroad tracks, Bonnel, Fla., to Truscon Steel Co.; Powell Bros. Inc., Jacksonville, Fla., general contractor.

130 tons, grade separation, Nassau county, New York, to Igoe Bros., Newark, N. J.; through Joseph L. Sigretto & Sons Inc.

125 tons, sewer plant, Terminal island, Los Angeles, to Jones & Laughlin Steel Corp., Pittsburgh.

122 tons, state highway work in four counties in California, to unnamed interest.

110 tons, grade separation, Queens, New York, to Igoe Bros., Newark, N. J.; through Nicholas Bonomo.

Unstated tonnage, marginal bars and metal center strips, highway, 4.421 miles, Corbin-Cumberland Falls road, Whitley county, Kentucky, to Laclede Steel Co., St. Louis; Louis des Cognets & Co., Lexington, contractor.

Unstated tonnage, grade separation and paving, Laurelton Parkway-Central avenue, Nassau county, New York, to National Bridge Co., Long Island City, N. Y.; Anita Construction Co., New Hyde Park, N. Y., general contractor.

Contracts Pending

2400 tons, sludge basins, easterly sewage disposal plant, Cleveland; bids Nov. 2. Project also includes 800 tons for building, still pending; also 100 tons of shapes.

1100 tons, state road work, New Jersey; bids at Trenton, Nov. 13.

700 tons, Federal building, San Francisco; bids Nov. 7.

470 tons, last section, West Side elevated highway, Thirty-eighth to Forty-sixth streets, Manhattan (New York); bids Nov. 3.

460 tons, highway, Bergen county, New Jersey. Also two bridges, 30 and 50-foot spans. Bids Nov. 13.

450 tons, government-aid housing development for hosiery workers, Philadelphia; bids Nov. 4.

450 tons, Saugus river, Revere-Lynn, Mass.

332 tons, lock 21, Mississippi river, near Quincy, Ill.; bids Nov. 7, United States engineer, Rock Island, Ill.

300 tons, approximately, state road work, Pennsylvania; bids Nov. 2 and 3.

265 tons, paving, Jones Beach parkway, New York.

200 tons, approximately, Wilmington, Del., high school; bids Nov. 15. This was previously reported as involving an unstated tonnage of bars. Approximately 1000 tons of shapes also will be required.

200 tons, road work in Atlantic county, New Jersey; general contract to Charles Prosser, Pitman, N. J.

180 tons, auxiliary detachment barracks, West Point, N. Y.; C. & W. Construction Co., Bronx, N. Y., general contractor.

176 tons, Panama; bids in Oct. 30, schedule 2914.

150 tons, highway and bridge, Arlington-Cambridge-Belmont, Mass.

145 tons, highway, Huntington-Barboursville road, Cabell county, West Virginia; bids in Oct. 31.

100 tons, road work near Morris Plains, N. J., William Eisenberg & Sons, Camden, N. J., low on general contract; approximately 120 tons of shapes to be required for a bridge in this project.

Unstated tonnage, dam No. 3, Allegheny river near Pittsburgh; Seeds & Durham, Philadelphia, general contractors, at $833,578.

Concrete Awards Compared

	Tons
Week ended Oct. 28	**3,885**
Week ended Oct. 21	**1,043**
Week ended Oct. 14	**6,965**
This week, 1932	**4,317**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,560**
Weekly average, Sept.	**3,365**
Total to date, 1932	**187,864**
Total to date, 1933	**156,644**

W. W. Sly Mfg. Co., Cleveland, recently furnished to the water department of Los Angeles sandblast equipment to clean automatically the inside and outside of water pipe. The pipe is made in sections 7 to 8 feet in diameter, of plates up to 1 1/16 inches thick, in lengths up to 30 feet. It is cleaned of rust, scale and other foreign substances before being painted with rustproofing.

Warehouse

Warehouse Prices, Page 47

Pittsburgh—Arising out of the complaint of the smaller steel warehouseman quantity differentials are revised, effective Oct. 23, to broaden the base of 400 to 3999 pounds to 400 to 9999 pounds. New plan also eliminates the former 60-cent concession for lots of 20 tons or more, which had worked to the disadvantage of the small jobber, and in its stead is a 35-cent concession. New bases on warehouse steel as of Oct. 16 and these revised differentials have failed to stimulate business. Prices on major items are holding unchanged except that an advance in cold-drawn from 3.20c is expected soon. Warehouses here have advanced prices on carriage and machine bolts out of stock to 65 off list. Track bolts, ¾-inch and smaller are 65 off compared with 70 off recently. Discounts apply per 100 count. On less than 100 count, 60 off list is now quoted. On large rivets, unchanged base of $3.25 per 100 pounds is quoted, or 6.00c per pound for lots under 100 pounds. Small rivets are now quoted 60 and 10 off list out of warehouse, plus standard extras.

Cleveland—Warehouses here are preparing to put the new quantity differentials in effect this week. Buyers will have to take larger quantities before they get above the base bracket and obtain discounts. The new mill extras have tended to give warehouses additional business. Final action has not yet been taken at Washington on the warehouse code.

Chicago—While orders are slightly less the month so far shows little change in volume from September. Discount on bolts and nuts in lots of 1000 pounds and over has been advanced from 65 off to 60 and 5 off. Other prices are unchanged.

Boston — New quantity differentials became effective Oct. 25, bringing higher prices in some brackets. Volume of buying has declined slightly.

Philadelphia—A change in quantity differentials on iron and steel out of warehouse is expected to go into effect shortly, in line with action taken by jobbers in other districts. Trading continues slack.

Detroit—Attention in the warehouse market is centered less on requirements than upon adjustments accompanying the new price schedules which provide for a delivered price in every city. Requirements for manufacturing are at a low ebb due to model changes. A little more demand is coming out as tool and die shops reopen.

Cincinnati—Volume from warehouses is showing no recession. The new price schedule has been generally accepted. Individual orders tend heavier.

St. Louis—Sales of iron and steel by jobbers maintain about the average volume of September and the early weeks of the current month. Prices are firm at the recent upward revisions, and except in the case of nuts and bolts, which may be advanced shortly to conform with higher mill quotations, no changes are contemplated at this time.

Colorado Fuel & Iron Co. has reemployed about 700 men at its various works, co-operating with the NRA.

Carbon and Alloy Steels
Blue Annealed Sheets,
Sheared Plates: also Billets.

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Diamond, Diamondette and Ribbed Patterns

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Pig Iron

Pig Iron Prices, Page 46

Pittsburgh—Prices are firm at the Neville Island and Sharpsville, Pa., base prices, first filed with the steel code in August. An advance has generally been speculated upon but, not appearing an early prospect, few melters are purposely stocking iron or becoming apprehensive over higher prices. The present market is quoted $18, Neville Island, for foundry grades; $17.50 for basic and $18.50 for bessemer. Several large tonnages of steel castings are required for locks and dams now being bid for the Ohio and Mississippi rivers. In the nearby Pittsburgh district, Dravo Contracting Co. is general contractor on the Gallipolis, O., and Winfield, W. Va., dams while a large roller crest dam for Montgomery island will be bid Dec. 12.

Cleveland — October shipments from lake merchant furnaces are approximately 20 per cent below the September tonnage. A more hesitant attitude on the part of buyers is noted, and sales here for the week dropped to around 2000 tons. Melters in this district do not have much more to place for the remainder of the year. The Ford Motor Co., inquiring recently for 10,000 tons of basic iron, has decided not to buy at this time.

Chicago—October shipments are expected to show but slight change from the September volume and although new business still is restricted as a result of orders placed earlier in the year, some foundries find it necessary to place small tonnages for immediate requirements. While higher prices are anticipated within the next four to six weeks, no announcement of a change as yet has been made. The market continues $17.50, furnace, for No. 2 foundry and malleable.

Boston—Pending clarification of first quarter prices, there is little activity. Sales are in small lots, but in fair number. Sellers have not yet opened books for first quarter. Larger consumers are covered for the remainder of the year.

New York—Carlot buying predominates. Next two or three weeks are expected to see some fairly substantial shipments of Buffalo iron come down by barge, as the barge season draws to a close.

Philadelphia — While contract shipments are holding up fairly well, fresh buying is exceedingly spotty. Prices are steady, with no change expected before producers open books for fourth quarter. The federal administration's recently announced intention of protecting NRA signatories against foreign competition is expected to have a firming influence on imported pig iron prices. Alan Wood Steel Co., Conshohocken, Pa., is low on 269 tons of foundry iron for Norfolk, Va., navy yard foundry at $22.03, delivered, for the bulk of the tonnage.

Buffalo — Demand has improved slightly after the recent drop but continues slow with large sales and inquiry absent. First quarter prices probably will be announced about Dec. 1.

Cincinnati — Buying, excepting a few spot orders, is absent and heavy inventories may retard bookings for the first quarter. Although aggregate tonnage of fresh orders is light, they are more numerous.

St. Louis — Stove manufacturers are taking relatively the largest tonnages of current shipments which despite a slight recession are well up to expectations. Sentiment is generally optimistic. Some first quarter inquiry has developed.

Birmingham, Ala.—The spot market is slow, melters holding back until needs are more pronounced. Base price is being maintained generally. Production shortly will be reduced further.

Toronto, Ont.—Demand is featureless, with no large orders booked either for spot or future delivery. The daily melt is holding at a steady rate, while mill operations are showing some expansion.

Ferroalloys

Ferroalloy Prices, Page 46

Ferromanganese is moving less actively, in line with falling steelmaking operations. Prices are unchanged at $82, eastern seaboard, on carlots. Domestic speigeleisen, 19 to 21 per cent, is $27, furnace, for spot delivery with specifications light.

Iron Ore

Iron Ore Prices, Page 46

Cleveland—Lake Superior iron ore shipments for the season will not reach some of the higher estimates made earlier in the year. The movement for the first 22 days in October was at the rate of 4,800,000 tons for the month, but it tapered considerably during the past week. Conservatively figured the total will be about 4,500,000 tons, which added to the preceding months gives 20,800,000 tons. Few, if any, ore cargoes will be brought down after Nov. 7. It is understood the Steel corporation will not load vessels after Oct. 31. A half million tons is forecast for November—21,300,000 tons for the season, compared with 3,500,000 tons last year.

Coke

Coke Prices, Page 46

Few sales have tested advanced prices on furnace and foundry grades of beehive coke, as most important melters are stocked on their requirements at lower prices and smaller users who are not stocked are operating at such a low rate that they do not need to enter the market immediately. Minimum prices, however, are firmly observed and call for a base of $3.75, ovens, for standard furnace coke, $4.25 on common foundry grades, and $5.25 on premium foundry grades. Higher prices than the above are quoted on small noncontract lots.

An advance in by-product foundry coke is expected to be announced Oct. 31 to accord with higher coal prices. Shipments of this grade of coke have held fairly steady.

Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 45

Several good orders for bolts, nuts and rivets were placed last week in the Pittsburgh market. Buyers anticipated their needs and are now laying in stocks. These orders were driven in by the uniform adoption of higher prices by Nov. 1. Although some makers advanced their spot market Oct. 16 and others Oct. 18, all producers will give contract buyers the new discount of 70 off on bolts and nuts, as well as 2.75c, base Pittsburgh, for large rivets, with the deadline this week. These prices apply until Dec. 31. The resale market on bolts, nuts and rivets was recently advanced proportionately. Wrought washers, based on Pittsburgh, Chicago or Philadelphia, are now quoted 6.00 off to small users and 6.25 off list to large buyers. Small rivets are quoted at 70 and 10 off.

Plant, real estate, machinery and certain finished products, including outboard motors, of the Muncie Gear Co., Muncie, Ind., in receivership, have been sold to William A. Spurling, an officer of the company.

Scrap

Scrap Prices, Page 48

Pittsburgh—A normal scrap market, in prices and operations, provides little comment, but describes the present quiet situation. Distress scrap is not overhanging the market. A slight flurry occurred recently when, instead of purchasing several thousand tons of No. 1 railroad melting steel at $12.50, a district mill simply permitted some overshipments. It did so by first consolidating all its unique balances on higher dealers' orders, adjusted the price to a flat $12.50, permitted shipments for a short time, then suspended last week. Several thousand tons of scrap will be on the market soon from the Woods Run plant of Pressed Steel Car Co., bids for junking the building plus machinery to be taken by Oct. 31. The Pennsylvania railroad is out with a 27,500-ton list to close Nov. 1. It offers 4800 tons of No. 1 steel; an unusually large item of No. 2 mixed turnings and drillings in 3700 tons; and 3539 tons of rails, among other items. No events have transpired the past week to alter a nominal buyers' market on No. 1 steel in this district quoted $12 to $12.50.

Cleveland—Demand for steel and iron scrap from steelmaking and foundry consumers is light but better buying is expected as the new month arrives. Water shipments continue to come from the north and west but are not large. Banking and blowing out of blast furnace stacks here and at Youngstown has limited business in those grades. New York Central closes a list here Nov. 1 on unstated tonnages.

Chicago—Heavy melting steel has declined 50 cents on small sales at $9, and with scrap offered at low prices the market is weak. While available supplies of old material are not excessive, extreme quiet in buying has served to depress the market. Steel plants and smaller consumers are conservative in ordering for future requirements, particularly in view of the recent decline in operations. Quotations on a number of other grades are lower although prices generally are normal.

Buffalo—A few small sales of scrap have been made but large dealers claim only distress tonnage has been unloaded and that the contracts do not represent the going market. No. 1 heavy melting steel, sold under these conditions, is reported to have brought $9.25 to $9.50 with the intention of purchasers being to accept other materials at differentials of $1.50 to $2.50. Larger holders of No. 1 heavy melting steel continue to ask $10 for tonnage, it is reported.

There has been a fractional easing in other grades.

Boston—Steel-making and other grades of scrap continue sluggish with scattered buying. The Worcester, Mass., consumer is not pressing for material, but is taking some No. 1 at $7.75, delivered, and No. 2 at $6.50 to $6.75.

Dealers' buying prices for heavy melting steel are off 25 cents and malleable scrap to consumers and scrap rails are also easier.

New York — Except continued buying for export, activity in scrap is slight. Dealers are paying $7.50 and $6.50, barge, for heavy melting grades for boat loading, but absence of demand from domestic sources subjects prices of most grades to little test. Bridgeport, Conn., continues to take light water shipments.

Philadelphia—Apart from a reported purchase of approximately 2000 tons of a particular grade of forge fire for an eastern Pennsylvania consumer, scrap buying continues light and with eastern steel making operations still declining, general improvement is not expected soon.

Detroit—Heavy melting steel and compressed sheets remain unchanged at $7 to $7.50 in a further weakened market, but most other grades are off 25 to 50 cents. Production of scrap has slumped materially due to the inactivity of motor plants at the period of model changing, but demand from melters is correspondingly slack. There is nothing in sight for the next few weeks to strengthen the market.

Cincinnati — Quotations on iron and steel scrap are considered nominal in absence of tonnage buying, most activity being to cover on contracts.

St. Louis—The market for iron and steel scrap continues quiet, with prices easier on practically all grades. Mills for the most part have sufficient material for present rate of operation for some weeks.

Birmingham, Ala. — Demand for steel and iron scrap is practically absent and prices have not been tested.

Toronto, Ont.—With export demand closed iron and steel scrap sales have gone into a slump. Steel grades are at a standstill and only general improvement is not expected soon.

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minor demand is reported for a few special iron grades. Consumers are buying as demands dictate, with orders mostly in single car lots. Dealers are not buying and prices are unchanged.

Strip

Strip Prices, Page 45

Pittsburgh—Shipments of strip steel are declining almost as fast as new buying. Hot-rolled strip is firmly quoted 1.75c, Pittsburgh, plus rail freights to important consuming districts, with the exception of Detroit, where under resolution No. 13 the Detroit delivered price is 1.95c. On cold-rolled strip, 2.40c base, Pittsburgh, remains the market.

Cleveland—Stripmakers hope for improvement in business with development of new automobile models, but for the present orders are composed solely of odds and ends. Makers revert to last spring to find weekly bookings as light as at present. Some mills report shipments on previous contracts as fair, though production is declining. Prices are steady.

Chicago—Strip shipments are declining and specifications are lighter. Reduced operations in the automotive industry account for a large portion of current quiet although demand from miscellaneous consumers also is slower. New business is being taken at 1.85c, Chicago, for hot strip and 2.40c, Pittsburgh-Cleveland, for cold-rolled strip.

Boston—Cold-rolled strip operations are lower, mills now being engaged on business taken at 2.60c, Worcester, which is light, following heavy specifications and shipments to complete old contracts. Larger consumers are generally well stocked for the next few weeks. Cold strip rollers are generally heavily stocked with hot strip taken in before the advance to 1.75c, Pittsburgh.

Philadelphia—Specifications for strip are steady at the low rate prevailing for the past month or so, with hot strip unchanged at 1.75c, Pittsburgh, or 2.04c, Philadelphia, and cold strip at 2.40c, Pittsburgh, or 2.69c, Philadelphia.

Cold Finished

Cold Finished Prices, Page 45

Pittsburgh—The market fails to reflect improvement either in specifications or shipments. Base of 1.95c, Pittsburgh, is holding and the market continues to be 2.00c at Cleveland, Buffalo or Chicago, with 2.15c, Detroit, and 2.20c, eastern Michigan, bases operative under resolution 13 of the steel code. Well-stocked inventories are reflected in the infrequency with which important users of cold-finished steel bars are in the market. Turned and ground shafting is quoted unchanged on the five Pittsburgh base classifications, which includes sizes from 1⅛ to 6-inch.

Railroads

Track Material Prices, Page 45

Railmakers have reduced prices on standard rail to $37.75, mill, a concession of $2.25 a gross ton. While this price does not conform to the quotation of $35 or less suggested recently by Co-ordinator Eastman, it nevertheless is regarded as opening the way for substantial rail buying this fall.

Earlier in the year railmakers dropped their price from $43, which had long prevailed, to $40, without creating a ripple in rail buying; it is believed this further concession, which brings this highly specialized product to a level under the market for certain common but major grades of steel, would not have been made if there were not some assurance somewhere that it would attract sizable tonnage. The rail requirements listed by Co-ordinator Eastman recently totaled approximately 850,000 tons.

The new prices, filed with the American Iron and Steel institute Oct. 21, are effective Oct. 30. The prices, which are being made effective by all producers, follow: No 1 grade, $37.75, mill; No. 2, $35.75; and all No. 2, $36.75. At Gulf ports $38.75 will apply on No. 1 and at Galveston, Houston and Port Arthur, Tex., $39.50. Pacific coast ports will take a price of $41.75. The No. 2 and all No. 2 classifications will take the above differentials of $2 and $1, respectively, at Gulf and Pacific ports.

The various classifications, it is explained, are all affected the same, the reduction of $2.25 in the No. 1 price applying throughout. The No. 2 classification applies to the usual percentage of second grade material allowable with each order for prime rail. The "all No. 2" applies to orders where only No. 2 is required. In conformance with the usual trade custom this latter business takes $1 premium over the price allowed on seconds, where constituting a small percentage of the total of an order which primarily is for No. 1 rail.

A committee of railroad men, including C. D. Young, vice president of the Pennsylvania railroad, and representatives of the American Iron and Steel institute have been conferring in an effort to bring about a modification of the present method of quoting steel to the carriers, a method apparently not generally looked upon favorably by either railroad buyers or producers. Recent openings have revealed several flaws in the present method, it is said. Some favor a return to the former plan of quoting f.o.b. tracks instead of f.o.b. points of destination. Other points also have been raised.

A solution of these problems is being pushed with the utmost haste, it is said, for considerable miscellaneous steel buying by the railroads is undoubtedly being held up.

Considerable interest is centered on possibilities of development of a broad buying program in freight car and locomotive markets. It is pointed out that such business would affect a more diversified group of industries than does rail buying, with a greater increase in employment. Inquiries for rolling equipment recently have been absent and repair work is slightly more active. Demand for miscellaneous steel products for car shop use shows little change. Releases of track accessories have been fairly steady, representing prompt requirements. Backlogs of rails are light but sufficient to permit limited operations for several weeks.

Car Orders Placed

E. I. duPont de Nemours & Co. Inc., Wilmington, Del., ten tank cars, to General American Transportation Corp., Chicago.

United States engineer, New Orleans, four asphalt cars, to Atlas Car & Mfg. Co., Cleveland; bids Sept. 9.

Rail Orders Placed

Norfolk & Western, 10,000 tons 131-pound sections, 7500 tons awarded tentatively to Carnegie Steel Co., Pittsburgh, and 2500 tons awarded tentatively to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

City of Chicago, 500 sets wheels and axles for 2-yard tunnel cars and 200 underframes.

Lynch Corp., Anderson, Ind., manufacturer of glassmaking machinery, is moving equipment and production of the O'Neill Bottle Machine Co. from Toledo, O., to Anderson. Plant of the latter has been bought by the Owens Illinois Glass Co.

Metals

Nonferrous Metal Prices, Page 45, 48

New York — Nonferrous metals showed a renewed price uptrend last week as a result of the latest inflationary pronouncement by President Roosevelt for the purpose of pushing commodities upward. Lead, copper and tin showed the greatest gains. Easiness in zinc was eliminated. Antimony, however, slipped lower. Aluminum and nickel held.

Copper—Supported by speculative buying, electrolytic copper again rose to above the 8-cent level as quoted by custom smelters. Lake copper producers also raised their prices. The large mine producers continued out of the market at the 9-cent figure quoted for several months and upon which copper and brass mill products and copper wire prices are predicated. Some slowing-up in the market advance late in the week was apparent but price appeared firm at the higher level. Ingot copper firmed up in the foreign market. Further progress was reported on the copper code negotiations but no official announcements were forthcoming.

Lead—American Smelting advanced its quotations a total of $6 a ton last week to the basis of 4.30c, New York. The usual 15-point differential over the St. Louis figure was resumed, Midwestern sellers quoting 4.15c. Demand was active and well diversified. Cable makers were comparatively the least active in the buying.

Zinc—Offerings of second-hand metal at concessions disappeared as general commodity levels appeared on the uptrend. Opinion in the trade was to the effect that zinc prices are headed for further rise due to the continued high price for ore and higher operating costs under the zinc code. Consumers are understood, however, to be well covered on future requirements and the market is expected for the time being to find little support in this direction.

Tin—Prices averaged considerably higher due to depreciation of the dollar in terms of sterling. Consumers placed little business despite the advance. The International Tin cartel is expected to permit increased production beginning Jan. 1, 1934.

Antimony—Prices were easier and demand negligible.

Coke By-Products

Coke By-Product Prices, Page 46

New York—Production of distillates has been declining. With consumer demand holding practically unchanged, distributors are unable to take much spot business, being pushed to meet contract requirements. Prices are firm, but unchanged. A tight market is sure to prevail at the time of seasonal contracting next month. Phenol buying has gained, with 200-pound lots going at 16.3c, and 100-pound lots at 17.3c.

Quicksilver

New York — Quicksilver prices are firm, and the market generally is quiet here although some interests report an increase in inquiry. Current quotations are $66 to $67, a virgin flask of 76 pounds in round lots, and 50 cents higher on small lots.

Wire

Wire Prices, Page 45

Pittsburgh.—Base prices on wire products are firm with $2.10 per keg quoted on nails, 2.10c on plain wire and $55 on fence. One important wire mill in the Pittsburgh district suspended operations last week. Although the steel industry lost some 20,000 tons of fabricated structural steel and concrete bar through the decision of the Citizens Conservation Corps to build wood instead of steel barracks, several government inquiries out now cover nails in some tonnage for this work as well as fencing and mesh.

Cleveland—Some chain and brush manufacturers report unusually good operations and have been buying considerable wire. Makers of welding rods also are fairly active purchasers. Nut and bolt manufacturers' requirements are slower; many jobbers have not yet signed fourth quarter contracts. Aggregate tonnage placed on mill books during the week was lighter than in recent weeks. Prices are firm.

Chicago—Wire demand is quiet and unchanged with no improvement in shipments of manufacturers' material or in wire products. Operations of most industrial consumers either are steady or declining, while jobbers are taking in little material. Requirements of farm districts are unchanged. Automotive demand reflects seasonal quiet and recovery is expected to be delayed until production of new models is advanced further. Plain wire continues 2.15c, Chicago, with wire nails $2.15.

Boston—Wire drawing operations in most departments are tapering. New buying and specifications, while lighter, are still fairly well spread and considerable business is up for public work. Plain wire is steady at 2.20c, Worcester, with spring wire, which is dull, 3.20c.

Anderson Stove Works, Anderson, Ind., is working two shifts with 315 men employed. Orders in hand indicate overtime work will be the rule for some time.

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Pacific Coast

Pacific Coast Prices, Page 45, 46, 47

San Francisco—(*By Air Mail*)—The structural steel market was the most active one of the week and bookings aggregated 6202 tons, the largest weekly total in over three months. The largest letting was placed tentatively with McClintic-Marshall Corp., Bethlehem, Pa., 3470 tons for shop buildings at the Puget Sound navy yard.

New warehouse prices went into effect in San Francisco Oct. 21, the advances ranging from $2 to $5 a ton. The price is the same whether delivered or called for and subject to quantity differentials. Wire nails are based on the consumer price of 3.20c, dealers getting 25 cents off, plus a 2 per cent cash discount. Los Angeles quotations are not yet in accord with the San Francisco prices, but when the code is accepted all Pacific quotations will be alike.

Reinforcing bar awards were rather light, less than 800 tons being booked. Jones & Laughlin Steel Corp., Pittsburgh, took two lots in the southern part of the state, totaling 350 tons. This is the first time in many months that eastern material has been sold in the coast markets. Soule Steel Co. booked 218 tons for San Gabriel dam No. 2, Los Angeles. New pending projects include 932 tons for buildings at Hamilton Field, Calif., and 700 tons for the federal building at San Francisco.

Only one plate award was noted. Chicago Bridge & Iron works booked 275 tons for a 55,000-barrel tank for the naval base at San Diego.

Among the larger structural awards reported were 942 tons for a shop building at the naval base, San Diego, placed with McClintic-Marshall Corp., 658 tons for an overhead crossing in San Bernardino county, California, secured by the Consolidated Steel Corp., and 360 tons for an inspection bridge for the San Francisco - Oakland bridge, awarded to the Columbia Steel Co.

Demand for cast iron pipe has improved considerably and several large lots are now pending. Awards were confined to small tonnages. Los Angeles has opened bids on 2758 tons of 6 to 24-inch pipe for delivery between Dec. 15, 1933, and May 15, 1934. Long Beach, Calif., will open bids Oct. 31 for from 1609 to 2222 tons of 20 and 24-inch pipe.

Seattle Projects Develop

Seattle—As public funds are being released, work is developing and several important projects are to be placed before the end of the year. Meantime iron and steel markets are quiet, this week's awards being unimportant.

Contracts awarded this week include 225 tons of shapes to Isaacson Iron Works, Seattle, for the Felts Field hangar at Spokane, J. T. Halin, Spokane, general contractor. Pacific Cast Iron Pipe Co. Provo Utah, is reported to have booked 200 tons of pipe and accessories for Lewiston, Mont. Seattle has opened bids on 150 tons of 24 and 36-inch water mains and tenders for the Seattle seawall improvement, involving 6500 tons of cast iron, reinforcing and steel sheet piling, are also under consideration. Tacoma has received bids for 50 tons of 16-inch cast iron mains.

Jobbers report a decline in turnover this week, as fall work appears to be drawing to a close. Poor demand is coming from agricultural sections where purchasing power is low because of the slow movement of crops. Warehouse business has been slow recently but under the new setup prices are well stabilized.

The drop in Japanese exchange has adversely affected the scrap market but negotiations will be renewed as quickly as this situation clears. Scrap suppliers are not much interested in offers from Oriental buyers but some business is being done. The trans-Pacific freight rate on scrap averages about $3 per gross ton.

Steel in Europe

Foreign Steel Prices, Page 47

London—(*By Radio*)—In the home market the outlook is generally confident, but exports are dull. Stocks of hematite on the east coast are decreasing. Middlesbrough steelworks report improved demand at firm prices. Quotations on heavy scrap grades are increasing.

The Midland markets show confidence in better conditions. Prices of merchant steel are hardening. The Scottish trade is of moderate degree. Sheet trade as a whole is active, though demand for galvanized sheets is less, but tin plate is firm, with Canada, Australia, China and Holland buying.

The Continent reports its export trade dull, though China has placed some orders. Berlin reports markets are calm except in the Near East and Africa. Generally, there are many inquiries but little business.

Equipment

Chicago—Sellers still find the railroads poor customers and with a lull prevailing in purchases by miscellaneous manufacturing industries prospective orders from the government and automotive interests appear the leading sources of new business. Machine tool inquiries are heavier principally because of requests for bids on navy equipment. Steel plants are buying principally for early needs only.

New York—Volume being figured by machinery builders and dealers is the heaviest in a long period, but largely limited to demands for the navy department. A long list of additional equipment, diversified, and including considerable heavy equipment, has been issued at Washington. The improvement for private industrial requirements has not been notable. William Sellers & Co. Inc., Philadelphia, is low on a good part of the group of horizontal boring, drilling and milling machinery opened for the navy department Oct. 17, although the Lucas Machine Tool Co., Cleveland, is low on several items.

Boston—Improved inquiry for metalworking machinery has developed, some of which has resulted in orders. Builders of textile mill equipment continue active, but with less new business arriving. Builders are figuring a subtantial number of tools for delivery in New England and other points for the navy department. Brown & Sharpe Mfg. Co., Providence, R. I. has booked an automatic screw machine for Portsmouth, N. H., navy yard.

San Francisco—Star Machinery Co., Seattle, is low on eight horizontal boring, milling and drilling machines for the Puget Sound, Wash., navy yard. Bids also were taken on the tools with certain aluminum parts for lighter weight, the machinery to be installed on board ships.

Semifinished Steel

Semifinished Prices, Page 46

Sheet bars and billets hold at $26 base, Pittsburgh. Wire rods also are firm at $35. Skelp is quoted 1.60c, Pittsburgh, and forging billets, 4 x 4 inch and over, $31 base, Pittsburgh. Demand for billets is slower but sheet bar shipments are well maintained. Several producers of tin plate are issuing steady specifications.

Charles F. Abbott Dies

(*Concluded from Page* 16)

general manager of the Flintkote Mfg. Co., a separately operated subsidiary of the Bird company.

From this position he went to the Art Metal Construction Co., Jamestown, N. Y., as assistant general manager in charge of sales. Later he was director of sales for the Celluloid Co., New York, following which he joined the National Analine & Chemical Co., division of the Allied Chemical & Dye Corp., as director of commercial research. He resigned this position late in 1923 to become executive director of the newly formed American Institute of Steel Construction, which post he held until his death.

As executive director, Mr. Abbott developed the American Institute of Steel Construction into one of the leading industrial associations of the country. From his broad experience in sales, he instituted a vigorous program of market promotion for fabricated steel. Working with the late Lee H. Miller, chief engineer of the institute, Mr. Abbott overlooked no opportunities to create a nationwide consciousness of the advantages of steel for construction. With Mr. Miller he toured the country at frequent intervals, speaking before architects, builders, contractors and other specifiers and users of steel. He placed a high value on public opinion and utilized every legitimate force of publicity to spread constructive information concerning steel as a building material.

While Mr. Abbott's activities during the past decade were devoted primarily to the interest of the steel construction industry, he was an ardent advocate of better merchandising on the part of the steel industry as a whole. Also, he retained a deep interest in sales problems of all kinds. He was one of the organizers of the New York Sales Managers club and of the American Society of Sales Executives. He has held the presidency of both of these organizations. Mr. Abbott was an enthusiastic student of advertising and trade association work. He was a member of the Advertising Club of New York, American Trade Association Executives, American Management association and many other organizations.

Wins Honor in Chemistry

Carbide & Carbon Chemicals Corp., New York, allied with the Union Carbide & Carbon Corp., has received the first award for chemical engineering achievement to be made to a company rather than to an individual. The award, sponsored by *Chemical and Metallurgical Engineering*, is public recognition of the effective use of chemical engineering in the advancement of industry since 1930.

Died:

(*Concluded from Page* 20)

and for 30 years maintaining an office at Bisbee, Ariz., as a consulting engineer, chiefly on mine equipment.

□ □ □

King L. Parker, formerly vice president, Emerson Electric Co., St. Louis, in that city, Oct. 19.

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Myron F. Westover, 73, in Schenectady, N. Y., recently. He was secretary of the General Electric Co. 34 years.

□ □ □

Herbert H. Dewey, vice president, International General Electric Co. Inc., in Schenectady, N. Y., Oct. 25.

□ □ □

William N. Doak 51, secretary of labor in President Hoover's cabinet, at his home near Washington, Oct. 23.

□ □ □

Joseph Heidenkamp, 71, president of the Pressed Metal Co., Pittsburgh, and associated with several glass companies in the Pittsburgh district, at Pittsburgh Oct. 25.

□ □ □

Nelson C. Spencer, 66, president, Spencer Air Conditioning Co., in Buffalo, Oct. 25. He was the founder of the company which manufactures various air conditioning equipment.

□ □ □

Fred A. Smith, 77, vice president of the Smith Mfg. Co., LaCrosse, Wis., for 47 years, Oct. 19. The firm was founded by his father, and after his death was carried on by five sons, of whom three survive.

□ □ □

John Fountain Jr., 71, retired inventor and manufacturer of electric conduit boxes, in Montclair, N. J., recently. He founded the Fountain Electrical Specialty Co., Elizabeth, N. J., and also was associated with the Jenkins Mfg. Co., Bloomfield, N. J.

Tin Plate

Tin Plate Prices, Page 44

Pittsburgh—Tin plate producers are operating at 95 to 100 per cent and canmakers are taking sufficient material to maintain this mill rate for at least another month. Considerable speculative buying is being done by the smaller canmakers who sense a higher market in tin plate. Announcement of the 1934 tin plate price will be made before another month and it is generally expected that an advance will be made. Spot price of $4.65 was tested on some fairly large orders recently when the Weirton Steel Co. was closed on account of a strike. Tin mill black sheets continue 2.50c, Pittsburgh.

Here and There In Industry

Tubular Service Corp., 120 Forty-fourth street, Brooklyn, N. Y., has established a branch office and warehouse at 23-25 Purchase street, Boston, by acquisition of the stock, goodwill and business of the steel tube department of the W. E. Adams Steel Co., Boston. The Tubular Service Corp. now has warehouse stocks and offices at Brooklyn, Pittsburgh and Boston. The company handles all grades of steel and alloy tubing. It is the direct distributor for electric welded mechanical tubes, made by Steel & Tubes Inc., seamless steel mechanical tubes, made by the Babcock & Wilcox Tube Co.; straight and bent boiler tubes, made by the Boiler Tube Co. of America; pipe and tube bends and coils, made by the Pittsburgh Pipe, Coil & Bending Co.; in the New York and New England districts.

□ □ □

Servel Inc., Evansville, Ind., manufacturer of refrigerators, is making additions to its plant to meet expected larger production next year.

□ □ □

Pittsburgh chapter of Used Machinery and Equipment Dealers held its first meeting recently at Pittsburgh, when the following officers were elected: president, William L. Moorhead Jr., Moorhead Reitmeyer Co., Pittsburgh; vice president, Charles J. Lang, Lang Machinery Co., Pittsburgh; secretary, M. D. Galbreath, Marr-Galbreath Machinery Co., Pittsburgh; and treasurer, H. J. Roth, Reliance Machinery Sales Co., Pittsburgh. Executive committee was appointed as follows: John D. Crawbuck, John D. Crawbuck Co.; Charles J. Lang, Lang Machinery Co.; F. C. McDonald, Pittsburgh Machinery & Equipment Co.; and S. A. Meyers, S. A. Meyers Co.

Offer Mercer Tube Stock

Receivers of Mercer Tube Mfg. Co., Sharon, Pa., will hold a sale Nov. 9 at 10 a.m. on the property of McDowell & Co., North Side, Pittsburgh, affiliate concern, on pipe, couplings and equipment of approximately 450 tons of black, galvanized and other grades of pipe in sizes ranging from ⅛-inch to 16-inch. John F. Post & Sons, Vandergrift building, Pittsburgh, are auctioneers. D. M. Naismith and D. V. Sawhill are receivers for Mercer Tube Mfg. Co.

Construction and Enterprise

New York

BROOKLYN, N. Y.—Garden Metal Co., 36 Garden street, has been organized by Harry Kaupp and Isaac Zwarnik.

BROOKLYN, N. Y.—Interboro Beverage Corp., E. M. Blumenkranz, president, has commissioned Shampan & Shampan, architects, 188 Montague street, to prepare plans for rebuilding the boiler house and installing new boilers in its plant, at cost of about $150,000. Company's plant is at Central avenue and Melrose street, Brooklyn, N. Y.

NEW YORK—Consolidated Manufacturers Supply Corp. has been incorporated with $6600 capital to manufacture aluminum products, by M. Schwartz, 25 West Forty-third street, New York, and associates.

New Jersey

PASSAIC, N. J.—Tidewater Iron & Steel Corp. has been incorporated with $75,000 capital to deal in iron and steel, by Edwin Fairclough, Passaic, N. J.

Pennsylvania

BRADFORD, PA.—City of Bradford, Francis Nash, solicitor, is negotiating for a federal loan to finance a municipal electric lighting plant.

GROVE CITY, PA.—Metals & Alloys Inc., Dr. E. J. Fithian, president, a newly established industry formed to reclaim nonferrous metals, is installing equipment and expects to be in production at its new plant in Erie avenue about Nov. 1.

Ohio

CLEVELAND—Wathey Foundry Co. has been formed by Arthur Wathey and associates and a foundry is being equipped in the former foundry plant of the American Shipbuilding Co., Center street. Production will be started in a short time.

ELMIRA, O.—King-Wyse Mfg. Co. has been incorporated with $25,000 capital to manufacture machinery, dies, and tools, by Harvey King and Leland and Edward Wyse.

Michigan

BATTLE CREEK, MICH.—Department of public works plans construction of a garbage incinerator plant to cost about $70,000.

DETROIT—Hyman Products Corp. has been incorporated with 2500 shares no par value to manufacture coin registers, by Daniel Hyman, 837 Pingree avenue, Detroit.

DETROIT—Aerseel Co., 1114 Buhl building, has been incorporated with $50,000 capital to manufacture automobile parts, by Charles E. McCormick, 1723 Houstonia avenue, Royal Oak, Mich.

LANSING, MICH.—Central Michigan Natural Gas Co., Lansing, Mich., plans a gas pipe line of 80 miles, from Isabella county to Lansing, to cost about $18,000.

Illinois

CHICAGO—Uptown Tool Works Inc., 1800 Foster avenue, has been incorporated with 1000 shares capital to operate a shop for welding, plating, toolmaking and casting of brass and other metals, by George M. Hicks, 30 North Wells street.

CHICAGO—Superior Fastener Corp., 4405 Northwest highway, has been incorporated with 1000 shares capital stock to manufacture machinery, equipment, tools and other metal products, by A. N. Lustig, City Hall square building, 139 North Clark street, Chicago.

CHICAGO—Retracto Mfg. Co., 3148 Cottage Grove avenue, has been incorporated with 500 shares no par value to carry on a manufacturing business, by Howard B. Hauze, 160 North LaSalle street, Chicago.

ROCKFORD, ILL.—Free Sewing Machine Co., 1915 Eleventh street, has been incorporated with 200 shares capital stock to manufacture sewing machines, needles and other products, by Essington & McKibben, Continental Illinois Bank building, 231 South LaSalle street, Chicago.

West Virginia

KANAWHA CITY, W. VA.—Insulated Steel Houses Inc., organized by Alvin Maccorkle, Union Trust building, Charleston, W. Va., will build rustless steel houses, maintaining a material storage and fabrication plant in Charleston, W. Va.

Texas

CONROE, TEX.—Martin Iron Works has taken over the D. & A. Machine Works plant here in charge of B. D. Grimes and also has established a machine shop at Tomball, Tex., in Harris county. Jack Martin is owner and manager.

CORPUS CHRISTI, TEX.—Neches Machine Works has been taken over by a company headed by J. A. Parker, Houston, Tex. G. A. Alviset, Box 1069, Corpus Christi, Tex., is shop superintendent. New equipment for the manufacture of oilfield pumps will be installed.

DALLAS, TEX.—Dallas Tank & Welding Co. has been incorporated with $2000 capital, by M. L. Vickery, Santa Fe building.

Wisconsin

BURLINGTON, WIS.—Old Dutch Brewing Co., 308 Guaranty building, Milwaukee, has been organized to take over a former brewing plant here and will spend about $50,000 in rehabilitating buildings and equipment. A. W. Sieglaff is president.

JANESVILLE, WIS.—K. C. Matthews, formerly of Chicago, has leased quarters in the Skidd building, West Milwaukee street, and is installing equipment for general machine shop service to garages. He is operating as Matthews Automotive Machine Co.

MILWAUKEE—The Chicago & North Western railroad has let the general contract to John S. Metcalf Co., 105 West Adams street, Chicago, for building and equipping a new conveyor and work house to supplant unit at its Rialto elevator here recently damaged by fire. Donohue-Stratton Grain Co., 207 East Michigan street, is lessee.

SHEBOYGAN, WIS.—Sheboygan Coal Co. has purchased the 495-foot dock of the Goodrich Transportation Co. on Lake Michigan at the mouth of the Sheboygan river here and plans extensive improvements.

SPARTA, WIS.—W. R. Crosby, L. E. Austin and O. J. Gustad have incorporated the Sparta Machinery & Pump Co. with $20,000 capital stock to manufacture pumps and other similar equipment for farms, estates, etc.

SUPERIOR, WIS.—The city council has engaged Frederick Perry, consulting engineer, Duluth, to make a curvey and submit estimates of the cost of building and operating a municipal heating plant. Fred A. Baxter is mayor.

Pacific Coast

LOS ANGELES—Mueller Co., Decatur, Ill., manufacturer of brass and iron plumbing supplies, water and gas valves is erecting a $250,000 plant in the Hostetter industrial district, to be in production by Dec. 1. Space is provided for eventual doubling of the plant.

ABERDEEN, WASH.—Northwestern Saw Works Co., 2501 West Second street, P. J. DeLorme president, will enlarge its plant and add to its production of band saws a line of circular saws and other cutting equipment. A large surface grinder has been installed and facilities added for repair of cutting equipment.

PT. ORCHARD, WASH.—Carl Siebrand, architect, has prepared plans for a $50,000 plant for the Kitsap Brewing Co., L. E. Woolsolk secretary.

Dominion of Canada

CORNWALL, ONT. — Courtaulds Canada Ltd. is building an addition costing $2,500,000 to its rayon plant. Foundation Co. of Canada has been awarded the contract for a structure 150 x 500 feet, two stories.

TORONTO, ONT. — Directors of Noranda Mines have decided to increase capacity of its concentrator at Noranda, Que., by 1000 tons daily, to bring its daily capacity to 3000 tons. James Y. Murdoch is president. The improvement will cost about $400,000. Equipment will also be installed for retreatment of tailings and a 100-ton cyanide unit for test purposes is being considered.